



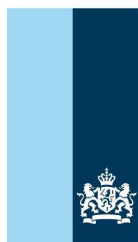
European Union Network for
the Implementation and Enforcement
of Environmental Law

IMPEL Project:

Comparison Programme on Permitting and Inspection of IPPC Pig Farming Installations in IMPEL Member Countries

Final Report

October 2009



VROM-Inspectie
Ministerie van Volkshuisvesting,
Ruimtelijke Ordening en Milieubeheer



Institute for
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Policy

Interprovinciaal Overleg **ip**^o

Introduction to IMPEL

The European Union Network for the Implementation and Enforcement of Environmental Law (IMPEL) is an international non-profit association of the environmental authorities of the EU Member States, acceding and candidate countries of the European Union and EEA countries. The association is registered in Belgium and its legal seat is in Brussels, Belgium.

IMPEL was set up in 1992 as an informal Network of European regulators and authorities concerned with the implementation and enforcement of environmental law. The Network's objective is to create the necessary impetus in the European Community to make progress on ensuring a more effective application of environmental legislation. The core of the IMPEL activities concerns awareness raising, capacity building and exchange of information and experiences on implementation, enforcement and international enforcement collaboration as well as promoting and supporting the practicability and enforceability of European environmental legislation. Projects in IMPEL's Annual Working Programme are co-financed by the European Commission.

During the previous years IMPEL has developed into a considerable, widely known organisation, being mentioned in a number of EU legislative and policy documents, e.g. the 6th Environment Action Programme and the Recommendation on Minimum Criteria for Environmental Inspections.

The expertise and experience of the participants within IMPEL make the network uniquely qualified to work on both technical and regulatory aspects of EU environmental legislation.

Information on the IMPEL Network is also available through its website at:

www.impel.eu

<p>Title report: Comparison Programme on permitting and inspection of IPPC pig farming installations in IMPEL Member countries</p>	<p>Number report: 2009-02</p>
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<p>Authors: Andrew Farmer and Megan Lewis</p>	<p>Number of pages: Report: 32 Annexes: 138</p>
<p>Project participants: Representatives of 17 IMPEL member countries and the European Commission</p>	
<p>Executive summary:</p> <p>Intensive pig farms above a specified capacity are regulated under the IPPC Directive. However, it has been noted that the control of environmental impacts can be difficult and the permitting and inspection regimes with regard to these installations show differences between the Member States. In order to examine the range of practice in the Member States, this IMPEL project was undertaken.</p> <p>The project undertook its work through a survey of IMPEL's views of key environmental issues arising from pig farms and a survey of how they address the regulatory requirements of IPPC (permitting, inspection, etc.) with respect to these. Three joint inspections were also undertaken to pig farms in Germany, Latvia and Italy to examine and compare issues and practices in more detail. Results of these activities were discussed at a project workshop, reaching conclusions and recommendations directed to IMPEL, its members, the European Commission and the relevant BREF Technical Working Group (TWG).</p> <p>Member States variously regulate pig farms above and below the capacity limit in the IPPC Directive. This includes conditions on animal housing, manure handling and storage and restrictions on emissions, including odour. However, for the latter specific use of air abatement techniques is limited. For manure spreading, some requirements may be included within IPPC permits, but many Member States use other regulatory regimes for control. This variation and complexity means that IMPEL members should explore further their experiences of integrating different regulatory approaches to achieve optimal outcomes.</p> <p>Manure storage systems vary across the Member States. Storage can occur in the pig stalls, in lagoons and in contained stores. Some Member States have a combination of approaches. Permits usually contain a range of details on the type, capacity, structure, etc., of the manure store. Some approaches are problematic for inspections, such as checking leakage from lagoons. It is not clear what is BAT under different circumstances and this should be explored further by the TWG. Also IMPEL members could develop protocols for integrity checking and other forms of inspection.</p>	

Manure spreading may result in water contamination, air and odour emissions. Some regulation may occur under IPPC, but other regulations are more usually applied, such as the Nitrates Directive. It is also important to note that implementation of the Water Framework Directive may add to the controls to be applied. There are legal problems integrating regulation – spreading may involve other farmers at some distance from the manure source. There are some ways to tackle this, but a fully integrated approach from manure production to spreading is difficult for many Member States. However, further integration should be pursued and the revised BREF should address manure spreading techniques.

There is a variety of animal housing systems in the Member States. Housing is a principle source of air and odour emissions. While conditions on housing are required in all surveyed Member States, the level of detail and variety of options varies significantly. In particular, the economic constraints of upgrading older housing are a problem in seeking farmers to improve their facilities. The ability to inspect housing also varies. In some Member States environmental inspectors are not allowed to enter housing for hygiene control reasons. These issues require further examination by the TWG. It is also important to ensure that permits contain conditions that can be readily assessed for compliance checking.

Air abatement systems are not common in the Member States. They are costly and only work with closed housing systems – so are probably not appropriate for a retrofit to older housing. However, they are useful in reducing ammonia and odour. Further research (by Member States and the TWG) should be undertaken on the costs and benefits of different air abatement options.

While odour is noted as a significant problem in many Member States, regulation varies. Some set minimum standard distances to neighbours, while others require estimates of emissions, modelling and odour measurements. As odour arises from different operational areas (housing, manure storage and spreading), an integrated odour management plan is often good practice. It is also possible that feed quality might affect odour. This area should be examined in more detail by IMPEL members and the TWG.

IPPC permits issued by the Member States vary in their level of detail. Few contain emission limit values, partly because of the lack of BAT AELs in the BREF. Most permits set a range of structural, operational and management conditions for various aspects of the farm. It is important for permits to set out all of the necessary conditions, that these can be checked by inspection and that they are simple for farmers to understand. The TWG should also consider how to make sure the BREF conclusions can better be translated into permit conditions.

Inspections vary in intensity and frequency, such as whether manure spreading or the inside of housing is included. They may also be integrated or medium-based inspections. Protocols for inspection could be developed by IMPEL members and it is important to ensure that methods are adopted to ensure the full conditions of the farm are inspected.

The project concluded that further exchange of information between IMPEL members on IPPC pig farming is important and that the results of the project should be taken forward by the BREF TWG.

Disclaimer:

This report is the result of a project within the IMPEL-Network. The content does not necessarily represent the view of the national administrations or the Commission.

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Annexes to the Project in a Separate Report

- Annex 1: Results of the Survey of Key Environmental Issues from IMPEL Members**
- Annex 2: The Questionnaire Used to Survey IMPEL Members on the Regulation of Pig Farms**
- Annex 3: Collation and Summary of the Results of the Questionnaire Survey**
- Annex 4: Summary of the Project Inspections to Pig Farms and Regulatory Authorities in Italy, Latvia and Germany**
- Annex 5: Workshop Agenda**
- Annex 6: Participants at the Project Workshop in Utrecht**

1. INTRODUCTION

Intensive pig farms above a specified capacity are regulated under the Integrated Pollution Prevention and Control (IPPC) Directive (2008/1/EC). However, it has been noted that companies operating several IPPC pig farming installations in different IMPEL Member Countries have suggested that the permitting and inspection regimes with regard to these installations show unnecessary and unjustified differences. In order to examine the range of practice in the Member States and examine how far any differences exist, this IMPEL project was established.

The aim of the project was for IMPEL members to learn from each other, to exchange experiences and know-how and identify good and where possible best practices in the regulation of pig farms. The project would also develop recommendations to assist regulators in improving the environmental performance of pig farms.

This report describes how the project was undertaken and sets out the key issues and conclusions concerning a number of environmental issues related to pig farming identified as important by IMPEL members. It also contains a range of recommendations to improve the regulation of pig farms and considers how further collaboration by IMPEL members on this issue can proceed.

2. PROJECT ACTIVITIES, METHODS AND MANAGEMENT

The project was managed by a Core Team consisting of representatives from IMPEL members from five Member Countries. The Core Team established the working methods of the project and identified the priority issues that would be addressed.

In order to facilitate the work of the project an information exchange forum was established. This allowed interested parties (IMPEL members and others) to register and view documentation generated by the project as well as other useful documents uploaded to assist understanding and debate. The aim of the forum was also to provide a platform for information exchange after the conclusion of the project.

The first task undertaken in the project was to survey the views of IMPEL members on the key environmental issues that they saw as important in relation to IPPC pig farms. The identification of key environmental issues was important in enabling the project to focus its work. The views were collated and the Core Team identified five issues that were most commonly highlighted as important:

- **Manure storage:** including issues of capacity, leakage, protection of water.
- **Manure spreading on land:** determining conditions for spreading, protection of surface and ground waters (interaction of IPPC with other regulations).
- **Animal housing systems:** impacts of different housing types on emissions, meeting requirements in the IPPC Best Available Techniques (BAT) Reference Document (BREF).
- **Air abatement techniques:** end of pipe techniques to control emissions, such as scrubbers and biofilters.

- **Odour assessment:** including public interaction and measures to reduce odour (other than housing and abatement techniques).

Further information on the survey of the key environmental issues is provided in Annex 1.

In order to investigate these issues in more detail, a questionnaire was developed by the Core Team which sought information from IMPEL members on how each of the key environmental issues was addressed during the regulatory process for implementing IPPC – applying for a permit, determining permit conditions, monitoring and inspection. At the end IMPEL members were also able to add any further points that they thought were important for the project. The questionnaire was circulated to IMPEL co-ordinators for distribution to relevant authorities. A copy is provided in Annex 2.

The questionnaire generated responses from 26 regulatory authorities across 17 Member States. Some responses were received from national level authorities, some from large regional authorities and some from local authorities. The type of authority also varied in their involvement with IPPC regulation of pig farms, for example with some involved in permitting, some inspection and some in all regulatory aspects. A detailed collation of the responses to the questionnaire is provided in Annex 3.

In order to understand the regulatory and environmental issues in the Member States, three visits were made to Member States. In each case joint inspections were carried out at IPPC pig farms to provide practical experience of the variety of farms in the EU and to discuss issues with the operator. Meetings were held to discuss the regulatory background in the Member State/region and to discuss the site permit in detail. The visits included participants from a number of Member States in order to provide different perspectives. Reports of the visits are provided in Annex 4 covering the following:

- Modena, Italy, 1-2 April 2009.
- Latvia, 23-24 April 2009.
- Schwerin, Germany, 7-8 May 2009.

The project concluded with a workshop in Utrecht, the Netherlands, on 10-12 June 2009 for 31 participants from 20 Member States (a list is provided in Annex 6). The workshop began with a visit to PTC Barneveld in the Netherlands to view some aspects of Dutch intensive pig farming in practice and methods to reduce environmental impacts. The workshop began with a review of lessons learnt from the joint inspections which, together with the visit in the Netherlands, provided a solid framework of practical experience for further discussion. The workshop then proceeded with discussion of each of the key environmental issues identified above. The issues raised, conclusions and recommendations form the basis for this report, which also draws on results from the questionnaire and Member State visits.

Participants at the project workshop in Utrecht



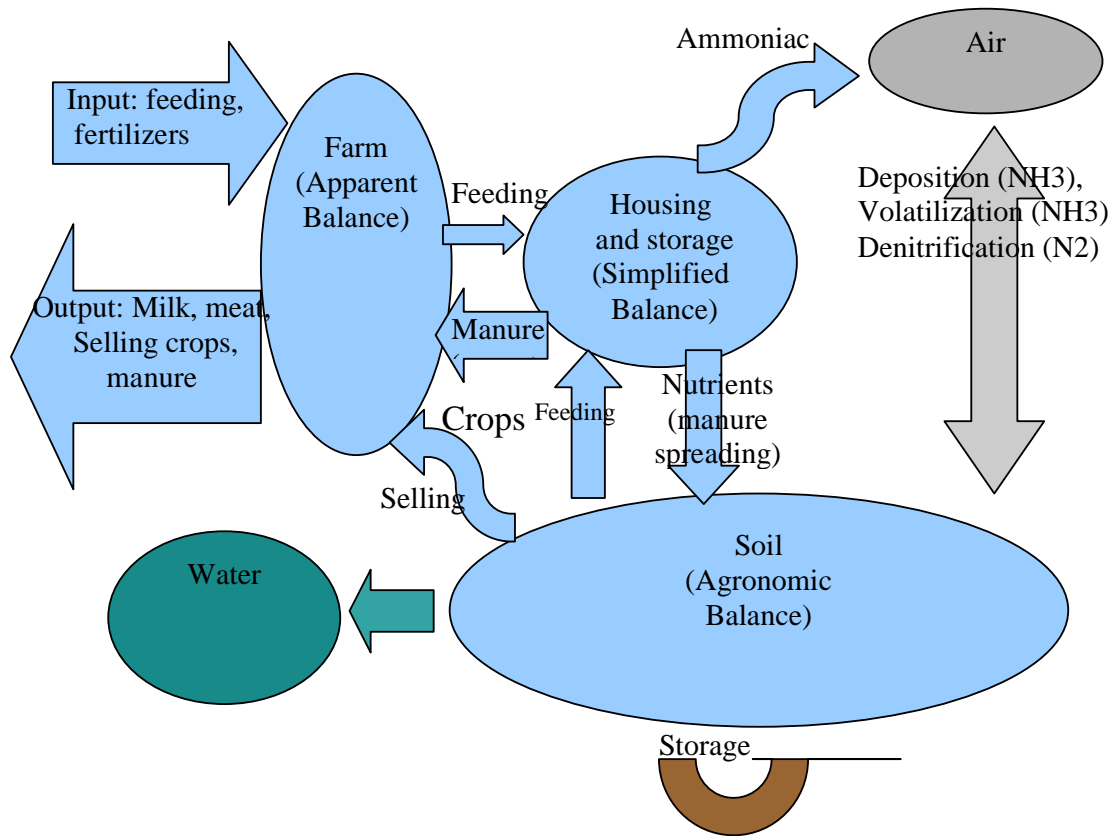
3. MAIN FINDINGS, CONCLUSIONS AND RECOMMENDATIONS OF THE PROJECT

3.1 Introduction

The following sections set out the main findings of the project. This begins with a consideration of the regulatory context of the project, examining the scope of the IPPC Directive and other relevant regulation. The report then addresses each of the five key environmental issues in turn, setting out the key issues that were identified, the regulatory context and conclusions. Finally, this section concludes with specific conclusions regarding the permitting and inspection processes. Each section includes recommendations. These recommendations are made to a variety of relevant audiences, including EU policy makers, the Technical Working Group (TWG) responsible for the revision on the intensive farming BREF and to national and regional authorities responsible for implementing the regulation of pig farms.

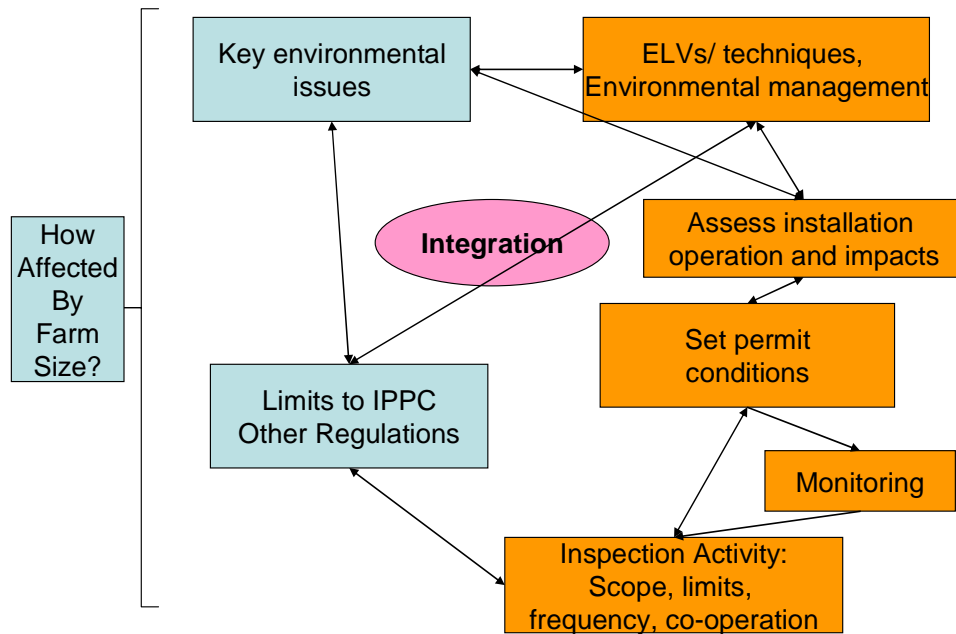
Pig farms have a variety of impacts on the environment. However, each stage of a pig farm has its particular impacts, but these are linked, such as is seen through considering the nutrient accounts of the farm. The following figure describes this. One can consider such accounts at different scales. For example, there is the global balance of the whole farm, there may also be an account generated by examining the housing and manure storage. Finally, nutrient accounts can be assessed at the field level (agronomic inputs and outputs). Thus the scale of assessment of the processes in and

around a farm are important in understanding its impacts and, importantly, in making effective regulatory decisions.



Bringing the environmental impacts and regulatory activities together is, therefore, important. The following figure sets out a conceptual model of the issues addressed in this report relating to intensive pig farms. The starting point is the key environmental issues – the main environmental problems that environmental authorities need to address. In assessing the operation of the installation and its impacts, consideration clearly has to be taken of available techniques, emission limits, etc., that can be used to address the problems. Assessment leads to the setting of permit conditions, reflecting available techniques and monitoring obligations, which should contribute to assessing compliance. However, compliance assessment is the realm of inspection, which varies in its scope (integrated or not, etc.), frequency, etc. These regulatory aspects are also related to whether issues must be, can be, or cannot be addressed within IPPC and whether other regulatory regimes are available (and whether these are integrated or implemented separately). All of these issues need to be thought of in an integrated way – how conditions and permit conditions relate to the key environmental issues, how inspection reflects the use of techniques, etc. They are not

separate compartmentalised stages. Finally, all of the issues – from the environmental problems to the last stages of regulation vary with the size of the farm.



This overview only sets a guide to the summary of analysis undertaken in the project set out below. Reality is more complex.

3.2 The Regulatory Framework

The primary regulatory focus of this project has been the implementation of the IPPC Directive to intensive pig farms. However, assessment of practical regulatory issues within the project has shown that it is usually not possible to consider the Directive in isolation. This is for the following reasons:

- The IPPC Directive applies to pig farms above a specified capacity. However, some Member States also apply the same or similar approaches to pig farms below this capacity.
- Some aspects of pig farming, particularly, manure spreading, may be difficult to include within IPPC regulation and are addressed under other regulatory regimes.

While some Member States establish specific regulatory regimes for different issues (or to implement different EU Directives), others have adopted approaches to bring

regulatory regimes together. This may be driven by an aim to provide a more holistic environmental and business focus on different economic sectors, including the agriculture sector. Indeed, such approaches are often highlighted as examples of 'better regulation'. In particular, in this project an emphasis on a holistic approach to manure management from production to use, on and off site, was made. Further consideration of this is given below.

This means that while Member States need to address the specific legal obligations set out within the IPPC Directive, they are not limited by the Directive in developing improved ways to deliver effective environmental outcomes for pig farming within, for example, a life cycle approach.

It is recommended that Member State authorities share further experience of how to integrate regulatory and environmental objectives in improving the environmental performance of pig farms and related activities.

As stated above, IPPC applies to pig farms above a specific threshold (determined by animal numbers). However, a number of Member States do not limit their regulatory activity to these farms. For example, in one area of France, it was reported that permits are applied to about 880 pig farms, although only about 50 of these are under IPPC. Setting objectives for smaller farms was not the primary focus of this project, but questions were raised on how this might be addressed, such as whether the level total ammonia emissions from a farm might be a trigger for applying specific conditions.

As noted in 3.1 above, the different phases of IPPC regulation are: permit application, instruction, permitting, monitoring and reporting, and inspection. French experience, for example, shows that the links between the different phases are not optimised, with some links working well, but others not. In Italy, for example, the permit contains a list of items that should be inspected, enhancing integration of the regulatory activities. These issues are not limited to pig farms under IPPC, but do need to be addressed in their regulation.

It is recommended that IMPEL members seek ways better to integrated actions across the regulatory cycle and share experience on this, particularly on linking permitting and inspection actions.

It is, therefore, important for the reader to take these comments on the regulatory framework into account through the rest of this report which, while focused on IPPC, is not limited to this particular item of legislation.

3.3 Manure Storage

The issue

Manure and/or slurry derived from pig farms needs to be stored before it is transported from and/or used by the farm. Such stores are potential sources of emissions to air (ammonia and odour) and are a risk of pollution to water. Some types of manure store can also be at risk of explosions, therefore safety is an issue. As a result, effective control of these environmental risks is important.

There is a range of different approaches to manure storage. Slurry can be stored under the pig stalls themselves. It can be transferred from the stalls to contained stores or to lagoons. These can be on the site of the farm, or off-site and may or may not involve separation of solid and liquid elements prior to storage. Such stores may be covered or not covered and be made of different materials (concrete, metal, etc). Different methods may be used to transfer the manure. In some cases the stored manure may be subject to treatment (e.g. in Cyprus with the use of aerobic digestion). The type of store will reflect the type of manure (solid or liquid, straw-based, etc). Different types of store seem to be favoured in each Member State. For example, the project visited a closed storage system in Germany (picture) and a lagoon system in Italy (picture).

Manure Storage in Germany



Photo: Joyce van Geenen

Lagoon System in Italy



Photo: Fausto Prandini

Regulatory issues

Regulators have to consider a range of different issues in assessing the performance of manure stores. These include:

- The number, type, material and capacity of the store.
- How long the manure has to be stored.
- Treatment of waste water discharged from lagoons.
- Ammonia and odour emissions.
- The relative importance of the environmental issues, e.g. how problematic is odour.
- Cost issues, e.g. in relation to the covering of stores.

Operators applying for permits typically are asked to provide a range of details on manure storage covering most of the issues identified above. However, the range of conditions set out in permits varies. Permits generally require stores or lagoons to be operated according to specific conditions. The Netherlands sets a condition on the maximum size of a store (for safety reasons) and many Member States set minimum capacity limits – ranging from four to ten months’ production. This variation reflects

constraints on spreading, such as in different climates. However, problems can arise, such as when disease outbreaks interrupt the ability to remove manure from farms.

Costs of manure storage are significant and this has posed problems for regulators, with farmers variously challenging the need for investment for new or modified stores or the timing of upgrading requirements in permits.

Manure storage can pose problems for inspection. For closed stores, systems to identify whether leakage has occurred are available. For lagoons, some Member States require these to be occasionally emptied to test structural integrity. Some Member States demand certification of the storage systems and construction materials as well as testing by certified companies. One method to identify leakage problems more rapidly is to monitor local groundwaters for lagoon systems and, for storage tanks, to include drainage systems underneath them which can be monitored for leakage.

Conclusions and recommendations

There are significant differences between the Member States in their approach to manure storage. It is likely that some variation is justified as environmental problems also vary. However, this does not mean that all variation that is currently observed is BAT.

Testing of manure stores, by the operator or inspector, can be problematic in some cases. By groundwater monitoring leakages can be identified, which is especially important in sensitive areas.

The upgrading of manure stores is a challenge for many farmers and for regulators in setting conditions which are both ambitious and realistic within a timeframe which is economic.

Manure is stored prior to its use in spreading, etc. The type of manure and treatment, if any, should be considered in an integrated way with the regulation of spreading. The two activities are strongly inter-related.

It is recommended that the BREF TWG undertake a careful examination of what is to be considered as BAT for manure storage taking account of the different situations in the Member States as well as new developments in this area.

It is recommended that protocols are developed with respect to effective and efficient testing of the integrity of manure storage.

It is recommended that the BREF TWG examine best practice in the testing of sealing/leakage of lagoons with different types of bottom construction.

It is recommended that regulators and the BREF TWG examine in more detail the costs and benefits of improvement options to provide clearer guidance for regulators on this issue.

It is recommended that regulators adopt an integrated approach to manure management, linking thinking on manure production, storage and spreading to optimise process and environmental outcomes.

It is recommended that there is a closer link between the development and implementation of good agricultural practices (e.g. by an agricultural authority) and the requirements of IPPC.

3.4 Manure Spreading

The issue

Manure (solid, slurry, etc.) when spread on land adds nutrients (nitrogen and phosphorus) to the soil, which can leach into ground and surface waters. This can be a problem where there are concerns over eutrophication of water bodies and/or nitrate levels in drinking water sources.

Spreading can also result in emissions to air – of ammonia and odour. The latter, in particular, can cause problems with nuisance to neighbours.

In some respects removal of manure from a farm can be viewed as a waste management issue. However, it is not simply waste, as it has a nutrient value for crops and when used in accordance with crop requirements is a fertiliser. In some Member States (e.g. the Netherlands) the quantities produced are so large that farmers pay to have it removed. In some others, the manure has sufficient value that farmers can sell it or at least give it to other farmers.

Manure spreading in France



Regulatory issues

Manure spreading is not commonly regulated within IPPC permitting (e.g. it is included in France). Some Member States (e.g. the UK) do include it if it occurs on land owned by the pig farmer on the same site. However, in some Member States (e.g. Ireland) pig farms generally do not own a significant area of farmland for spreading the manure generated.

Manure spreading is subject to other regulatory constraints. Within EU law the Nitrates Directive (91/676/EEC) is most prominent, limiting the total quantity of nitrogen that can be applied, with restrictions on when it can be applied (e.g. time of year, restrictions concerning waterlogged or snow-covered soils, etc.). It should be noted, however, that such restrictions apply either in designated Nitrate Vulnerable Zones or the whole territory of some Member States, depending on nitrate problems. The conditions are not, therefore, universal. There is also concern over phosphorus. There are no prescriptive controls at EU level on this issue. However, it is likely that implementation of Programmes of Measures under the Water Framework Directive (2000/60/EC) will require action in some catchments to reduce phosphorus and this may result in further restrictions on manure spreading. This will pose a problem for regulators as arable farmers, for example, may be prevented from using manure due to phosphorus limits while still needing to add nitrogen. This would imply a use of artificial nitrogen fertilisers rather than pig manure, which would increase problems for manure disposal.

Where pig farmers provide manure to other farmers for spreading, Member States adopt different approaches to integrating regulation. In Poland there is a requirement for pig farmers to own 70% of the land on which spreading will occur. Others (e.g. Romania) require a contractual arrangement between the pig farmer and the recipient farmer, or that the recipient has a nutrient management plan. In Ireland, for example, the pig farmer must demonstrate that there is adequate recovery capacity available for the quantity of slurry generated on the pig farm, which involves the pig farmer establishing in association with the receiving farmers a nutrient management plan for each farm, i.e. the pig farmer must take some responsibility for ensuring that the pig slurry is managed appropriately and recovered as fertiliser rather than being disposed of. Such approaches imply a direct relationship between the producer and user, i.e. the producer of the manure knows where it will be spread. However, in some cases (e.g. the Netherlands) producers pay an intermediary company to remove manure, so there is no direct link to the final user.

There are legal problems in linking the conditions applied in permits to pig farms and the use of manure by third parties. Indeed, even if the same person is involved, they can establish separate companies (legal entities) responsible for the pig farm and for manure management to inhibit integrated regulation. Even if permit conditions require the operator to ensure the recipient of manure has a nutrient management plan (or similar), that plan cannot be enforced through the permit. There is concern, therefore, about the value of such a requirement. However, some conditions can be established which assist the process, such as testing of manure quality and record keeping by the pig farmer and receiving farmer.

Farmers spreading manure can be subject to a range of conditions, such as methods of application (injecting, timing of ploughing, etc.), ensuring soil suitability, avoiding slopes, etc. This is often accompanied by the need for a nutrient management plan, implying a need for information on the quality of the soil and manure (e.g. for nitrogen and phosphorus), obtained by tests or use of standard factors.

The challenge for more integrated regulation from producer to spreading can reflect institutional arrangements in Member States. In many, manure spreading is overseen by an agricultural institution (Ministry or regional department), while IPPC is implemented by an environmental authority. In Modena, Italy, responsibility for IPPC intensive farming installations was given to the Provincial agricultural department (other IPPC installations are the responsibility of the environment department), which is also the responsible institution for protection of the water bodies. This arrangement has led to a more integrated approach to manure management. In England and Wales the Environment Agency is responsible for IPPC, but also has significant involvement in regulation aspects of agriculture, which has led to the development of a 'whole farm approach' to improving environmental and regulatory performance. This helps bring manure management thinking together.

Conclusions and recommendations

There is wide consensus on the problems that arise from manure spreading. However, addressing these is not always easy. IPPC does not cover all of these, although other regulatory approaches can be effective in improving environmental performance. Nevertheless, new challenges are on the horizon, such as the need to implement the Water Framework Directive.

It is recommended that Member States should adopt integrated approaches to manure management - from production to spreading. IMPEL members should exchange further experience on opportunities and constraints in doing this.

It is recommended that the BREF includes BAT and best practice in manure management/spreading.

It is recommended that authorities identify the key obligations that will arise from implementation of the Water Framework Directive and ensure these are integrated with obligations on farmers with regard to manure spreading.

It can be difficult to ensure afterwards that spreading is undertaken according to prescribed conditions, therefore it is recommended that inspection activity is undertaken during spreading.

3.5 Housing systems

The issue

Efficient animal housing is critical in reducing the environmental impact of intensive pig farms. Housing includes the structure of the pig stalls or pens (which vary according to the specific nature and stage of the pig production), type of flooring, manure storage and handling in the housing, ventilation systems, feed systems, etc. The nature of the housing also varies with the age of the farm, with older farms typically less ‘sealed’ than newer housing. Also variations in production methods mean that in some farms pigs are maintained closely within stalls, while for others they may have freedom of movement within straw-covered pens or even have access to areas outside of the housing.

Housing is a principle source of emissions to air – ammonia, odour and particulates. Specific abatement techniques are addressed in the following section, but a variety of techniques can be employed to reduce such emissions within the housing, particularly effective floor construction that allows efficient removal of manure.

Exterior of animal housing in Latvia



Photo: Kerstin Elberskirch

Interior of animal housing in Latvia



Photo: Kerstin Elberskirch

Regulatory issues

There is significant debate in some Member States on what is BAT in relation to different aspects of housing. For example, some farmers prefer deep slurry storage, but this is not considered to be BAT in the BREF. The Netherlands has a long list of different animal housing types that it has determined as BAT for specific pig production situations. Also interpretation of the BREF is difficult, such as what is meant by 'frequent' removal of slurry. In Slovenia operators are required to refer to the BREF in order to determine what is BAT for housing systems. However, most have problems with this, being unable to use such a large technical document in English.

For older housing regulators often require upgrade plans from farmers. However, there is significant debate on what timescale for upgrading is appropriate. Some argue that upgrading should take place after the end of the usable life of the building, but this could be several decades. Alternatively, some regulators impose relatively tight timetables for change (2-3 years), although this does have to take account of changing economic conditions. Wide disparity on this issue between the Member States could have economic consequences, but it is not clear what upgrade timetable would be reasonable.

The level of detail on housing varies in the conditions set out in permits. In the Netherlands specific details of housing design usually are established in permit conditions; inspection is carried out at this detailed level. In contrast, in the UK the permit itself does not prescribe housing conditions, but requires operators to operate

the housing according to the details provided in the permit application and may require the operator to undertake a review of housing and its management. Where housing conditions are not prescribed in the permit, it is not possible subsequently to assess compliance, as is the case in Slovenia.

Many aspects of housing cannot be easily inspected during operation. The structure of manure collection, storage and movement under the animal stalls is, for example, difficult to inspect. Therefore, it is important to undertake an inspection of these issues during construction, especially as these are unlikely to change during operation.

Housing can pose problems for inspectors. In some countries (e.g. Portugal) inspectors do not enter housing due to hygiene concerns, while in others (e.g. Slovenia), inspectors regularly enter the housing. Therefore, in the latter permits may prescribe the capacity of the installation (number of pigs) and inspectors enter to check this. This is further addressed in the section on inspection, below.

Conclusions and recommendations

Ensuring effective housing consistent with BAT is a significant challenge for authorities. Interpretation of what is BAT is sometimes difficult, as is the ability to persuade farmers to invest in improvements.

It is also important to stress the conclusions from earlier sections of this report of the need for integrated thinking on ammonia and odour management, so that housing design and pig production (e.g. feed quality) are not addressed in isolation from the regulation of manure storage and spreading.

The following recommendations are, therefore, made.

It is recommended that the European Commission give consideration to how to make the BREFs better available to the Community's stakeholders in languages other than English.

It is recommended that IMPEL members exchange further information on experience on upgrading requirements for older farms and, in particular, the justification for these decisions.

It is recommended that IMPEL members exchange further experience on the types of detail on housing set out in permit conditions and how these can be used in compliance assessment.

It is recommended that permitting authorities should consider establishing some conditions in permits to ensure that critical requirements related to housing are defined in such a way that compliance can be assured.

3.6 Air Abatement

The issue

The principle emissions to air from pig farms are ammonia, odour and particulates (the latter especially for straw-based farms). Many techniques can be applied to reduce these emissions, including changes of housing design (e.g. flooring, ventilation, etc.), methods for manure transfer, storage conditions, etc. To supplement these, end-of-pipe techniques have also been developed. However, very few Member States (at least Germany and The Netherlands) have reported that such techniques are either being used by farms or are being actively considered by regulators for inclusion within permit conditions.

Air abatement system in Germany



Photo: Joyce van Geenen

Regulatory issues

Air abatement systems are costly. Indeed many consider them to be prohibitively expensive for routine application. Some members highlight the importance of linking the need to require air abatement systems with clear evidence of impacts of ammonia or odour, but that this can be difficult to prove in practice. The use of other techniques to reduce pollution in housing design, feed quality, etc., should be explored to determine if these would be sufficient to address the problems identified before seeking to impose end-of-pipe solutions.

In some cases air abatement systems can be cost effective. Adding an air abatement system to an existing stall would usually cost less than building a new housing system.

Air abatement systems only work if the housing is a closed system, whereby all exhaust air can be treated. This is problematic for older housing, which may 'leak', resulting in significant non-point sources of pollution. Where air abatement systems are required, it is also important that they are fully effective, as there is concern that some might decline in effectiveness over time. The effectiveness over time is also very much dependent on the operation by the farmer. This means that inspection on this issue is very important.

Permitting authorities generally ask operators for information on air emissions during permit application – their type, sources and, sometimes, their behaviour in the environment. However, while permits often contain management or structural obligations to reduce emissions, it is rare for emission limit values to be set in permits. There are no emission levels associated with BAT provided in the BREF and the use of ELVs is only possible where diffuse sources are minimal and may be most appropriate where air abatement is required.

Conclusions and recommendations

Air abatement systems are useful in reducing emissions where these are causing serious environmental problems that are hard to tackle through other means. However, it is not clear how often this would necessarily be the case, even for new housing, and, therefore, when such abatement systems are BAT.

The primary focus should be on the environmental outcomes – ensuring that emissions do not cause adverse impacts. Therefore, the benefits and disadvantages of air abatement systems should always be compared to those from process integrated techniques.

It is recommended that those authorities/Member States which require the use of air abatement systems undertake further analysis of the effectiveness and costs of different systems and how these compare for different farm types. This information should be made available to all IMPEL members.

It is recommended that the BREF TWG undertake a detailed examination of the different types of air abatement systems, examining their relative effectiveness, their effectiveness in comparison with other techniques to reduce emissions (including over time and with respect to the size of the farm) and the relative costs of such systems.

3.7 Odour Assessment

The issue

Odour is the principle concern that arises from local communities in relation to pig farms. It can cause a nuisance and result in complaints. Odour arises from the pig manure and the animals, therefore it can come from housing, manure transfer and

storage and manure spreading. A study in the Netherlands found that about half of the nuisance arose from housing and half from manure spreading, control of which requires different regulatory approaches. However, experience in the project also shows that the level of odour that arises from pig farms varies significantly. This partly reflects measures taken to control emissions, but also other factors, like feed, may affect the odour levels.

There is a range of techniques that can be taken to reduce odours (see the sections above) on manure storage, spreading, housing systems and air abatement – reflecting structural changes and management approaches. However, it is important to link the techniques applied with the level of odour problem. It is likely, for example, that the degree of nuisance of a particular odour level varies according to location and context.

Regulatory issues

The regulatory system for odour from pig farming usually only covers the pig houses, although some Member States also set rules for spreading in relation to odour. Some Member States set an objective in a permit to minimise complaints. Odour complaints can be recorded, validated and ‘quantified’, this being the most basic assessment method for odour impact.

Other Member States have established minimum distances by which new pig farms can be built in relation to housing (e.g. 200-300 m in Sweden to 2 km in Cyprus). Minimum distances may also vary with the type and number of animals and applied odour abatement techniques. Such a requirement is also an aspect of the land use planning processes.

A few Member States (e.g. Germany and the Netherlands) set numerical odour immission limits in permits (e.g. in the Netherlands dispersion modelling should usually show odour immission caused by pig houses is not greater than 2-8 ou_E/m³ as a 98th-percentile at the nearest housing). Therefore odour emissions are measured or estimated using standard emission factors and are subject to dispersion modelling.

As with ammonia emissions, few Member States set requirements for abatement systems to control odour. In most cases, conditions in permits concern the need for effective manure management, housing ventilation and manure storage conditions. End of pipe air abatement techniques can also be effective to reduce odour from pig houses. Masking agents may be expensive and are seldom effective. They also add additional chemicals to the environment. For this reason the Netherlands, for example, is opposed to their use.

For spreading, nuisance can be minimised by taking account of wind direction, public holidays, etc. A good approach is to set a condition for a farmer to have an odour management plan that includes all potential odour sources and seek to control these in an integrated way.

Inspections can check whether the odour control conditions are being applied, minimum distances respected and the numbers of animals is in compliance with the permit. However, if specific odour limits are required of operators, these can be more difficult to enforce: monitoring the odour emission and immission is possible but is

costly and time-consuming. Nevertheless, a check on the number and type of animals and the housing system, as well as a check on the proper functioning of the abatement techniques, are achievable and usually give a good estimate of the expected odour impact. Complaints, although subjective, are an indication of severe nuisance. However, it can be difficult for inspections to determine whether complaints are due to a failure by the farmer to do what is required in the permit, or whether problems were not adequately addressed during permitting.

Conclusions and recommendations

Setting detailed conditions to control odour is often problematic for regulators. However, using standard distances for new farms in land use planning and use of odour management plans in permitting are good practice.

The BREF TWG should seek to quantify the relative reductions in odour that can be achieved by different techniques and how these can be used separately or in combination to give different desired outcomes.

It is recommended that authorities consider using odour management plans with operators, including all aspects of pig farm operation from production to manure spreading.

It is recommended that further work is undertaken to establish the relationship between feed type and odour production.

It is recommended that IMPEL members exchange experience in the setting of conditions regarding odour that can be effectively checked during inspection and are enforceable.

3.8 Permitting

A number of issues related to permitting have been addressed in the sections above. However, it is also important to note some general conclusions. The project identified a variety of approaches to permitting in the Member States. Most authorities require operators to provide a significant range of information during the permit application process, including details on animals, housing structure and performance, manure management, storage, emissions and details of any directly associated activities. However, the degree of detail in permits varies between the Member States. Some are relatively detailed, with conditions on many aspects of the operation of the installation. However, others are relatively short, with a limited number of prescribed conditions.

It is important to note that few permits contain emission limit values that the operator has to meet (these may be prescribed where air abatement is required). Indeed, it was noted that the BREF contains no BAT associated emission limits. While some members found, therefore, that the BREF was difficult to interpret in setting permit conditions (particularly in comparison with most other IPPC sectors), it was also noted that setting emission limit values for this type of installation is problematic.

Therefore, most conditions relate to the structure and management of the installation and the techniques applied.

The conditions with which operators have to comply can be established in different ways. Many are established on a case by case basis in bespoke permit conditions. To a certain extent this is inevitable, given that no two farms are the same. However, some conditions may also be set out in general binding rules or other forms of national or regional legislation. These may relate to emissions or to quality objectives. This full range of sources of conditions was particularly evident in the project visit to Germany.

It was also noted that there are strong interactions between the techniques applied to reduce emissions in the environment – controls on air emissions, for example, may have consequences for water. Therefore, an integrated assessment needs to be made in setting permit conditions, so that there is a holistic view of what is BAT. For example, an assessment could be based on nitrogen emissions as a whole (ammonia, nitrate, etc.) as an integrating tool, while also addressing local impacts. The development of such assessment methods and tools should be shared between the Member States and inform the work of the TWG.

Participants also noted that farm owners are not like many other industrial IPPC operators, which may have an environmental manager (or similar). Therefore, it is important for permits to be clear and easy to understand in order to assist operators in achieving compliance.

It is recommended that the BREF TWG, in revising the BREF, pay particular attention to recommendations for how its conclusions on BAT can be translated into practical permit conditions.

It is recommended that permitting authorities ensure that all permits set out all of the conditions necessary for the farm to avoid environmental problems and that these are clear enough so that compliance can be assessed.

It is recommended that integrated assessments of techniques to control emissions to different aspects of the environment are made and that these approaches are shared between Member States and used by the BREF TWG.

It is recommended that permits are written in as simple and clear a way as possible, particularly that all compliance conditions are clearly set out, without recourse to cross-reference to annexes, etc.

3.9 Monitoring and Inspection

Monitoring is an important aspect for all IPPC installations in order to assess their operation, environmental performance and compliance with permit conditions. Member State authorities require a range of monitoring obligations on pig farms. These include detailed recording of animal numbers, manure management procedures, integrity of manure stores, etc. Obligations for direct monitoring of emissions are rare, though this may occur where air abatement systems are in place. Some ambient

environmental monitoring may be required, such as for odour levels in sensitive locations. Importantly, where lagoons are used, groundwater monitoring is an important means to detect problems with leakage. For manure spreading, monitoring is generally limited to keeping records of spreading activity (timing, amount, location, quality, etc.). However, the project identified some concern over the accuracy of reliance on records alone.

Inspection of intensive pig farm installations and related activities varies across the Member States. Results from the questionnaire noted that inspection frequency varies significantly between and within Member States, from several times per year to once every four years. The Member State visits also noted that inspectorates may focus on specific issues, e.g. with separate inspections for air and water issues, while in other cases fully integrated inspections may occur.

The project also identified significant constraints on some aspects of inspection. For example, as noted above, inspection of the structural integrity of lagoons is particularly problematic. In some Member States there are also problems for inspectors to enter within the animal housing itself due to concerns over hygiene and spread of disease. It was also noted that inspectorates can find difficulties in interpreting conditions in permits with which they are to assess compliance.

Various procedures have been adopted to address these problems. Inspectors addressing different environmental issues do collaborate on inspection visits. This reduces the burden on the operator and enhances understanding of the installation. Also important is collaboration with veterinary inspectors who enter animal housing and can check issues of importance for environmental inspectors, where the environmental inspectors do not have access.

Overall, the results from the project demonstrate that what constitutes an ‘inspection’ varies. Therefore, care has to be taken in interpreting general data on inspection activity and there could be problems in interpreting how general inspection obligations (such as is set out in the Commission’s IPPC Recast Proposal) are realised in the practical supervision of pig farms.

For example, for many Member States manure spreading is not included (or included in a limited way) within IPPC permits. Spreading activities, as noted above, are though usually subject to regulatory obligations. However, inspection of these can often be limited. In some cases regulation is by an environmental authority (also covering IPPC), while in others this may be by an agricultural authority. While farmers are often required to produce manure or nutrient management plans, most regulatory checking relies on examination of records. There is concern whether these are accurate statements of what happens in practice. More on-site inspection is, therefore, likely to be beneficial.

An important conclusion is that there is no single ‘definition’ of what constitutes an inspection. An inspection may assess compliance with all aspects of permit conditions or address parts of the permit. This becomes important where there is guidance or even prescription to undertake inspection activity. In such cases it is important to be clear what constitutes an inspection.

It is recommended that the European Commission (and other EU institutions) considers the scope and limits of inspection activity in further revision of the Recommendation on Minimum Criteria for Environmental Inspections or setting out inspection requirements in a revision of the IPPC Directive to ensure that this reflects the variety of practices, constraints and opportunities in the Member States.

It is recommended that inspectorates identify ways to undertake occasional checks to ensure that record keeping by IPPC operators and farmers spreading manure is accurate.

It is recommended that Member State authorities establish practical working relationships with other inspectorates, where necessary, to enhance the effectiveness and scope of inspection activity. Exchange of experience on this between IMPEL members would be welcome.

It is recommended that inspectorates work closely with permitting authorities (where these are separate) to provide feed-back on how to ensure that permit conditions are set in such a way that they can be properly assessed during inspection and, therefore, that compliance can be determined.

It is recommended that relevant Member State authorities develop plans for on-site inspection of selected farms during manure spreading in order to ensure spreading plans are complied with.

4. PROJECT FOLLOW-UP

This project has addressed a range of regulatory issues relating to intensive pig farms. However, project participants have recognised that it is only the start of a process of improving understanding of the issues and improving regulation by IMPEL members. It was agreed, therefore, that activities should continue after the formal completion of the project itself.

In particular, project participants noted that the Technical Working Group for revision of the intensive farming BREF could benefit from the conclusions and detailed information arising from the project and follow-up activities, both directly and to guide further investigation by the TWG. This report makes specific recommendations for the TWG, but it is also clear that IMPEL members have further information from which the work of the TWG could benefit and that there are questions or issues that the TWG should examine in more detail than has been possible in this project.

The participants concluded that the information exchange forum established for the project should be maintained for further exchange by Member State authorities. The types of information that could be shared include:

- Examples of permits issued in each Member State.
- Development of a standard list of permit requirements.
- Examples of guidance issued by the Member States to operators.
- Assessment methods for different environmental problems.

- Practice on taking into account Programmes of Measures under the Water Framework Directive.

Further activities might also be appropriate, such as undertaking joint inspections to share experience or joint training.

Overall, therefore, participants recognised the value of the project in identifying the key regulatory challenges that the Member States face in improving the environmental performance of intensive pig farms. Key conclusions have been identified and recommendations made. However, further collaboration between IMPEL members would continue to add value to the work already undertaken and assist members in their work.

It is recommended that IMPEL maintains an information exchange forum in order to facilitate exchange of practical experience on the regulation of pig farms by its members.

It is recommended that IMPEL members identify key information sources (e.g. national guidance, permits, etc.) that would be useful for other members to benefit from.

It is recommended that there should be a follow-up project(s) on how to assess the emissions of ammonia and odour from (not only pig) farms in the permit procedure and how, subsequently, to set permit conditions and undertake inspections. Currently, Member States adopt different approaches, use different models, etc., so that a detailed comparative assessment would be useful.

5. SUMMARY OF RECOMMENDATIONS

The project has identified a number of recommendations set out in the sections above. These are summarised below rearranged according to the various audiences to which they are directed.

5.1 Recommendations to the European Commission

1. *It is recommended that the European Commission give consideration to how better to make available the BREFs to the Community's stakeholders in languages other than English.*
2. *It is recommended that the European Commission (and other EU institutions) considers the scope and limits of inspection activity in further revision of the Recommendation on Minimum Criteria for Environmental Inspections or setting out inspection requirements in a revision of the IPPC Directive to ensure that this reflects the variety of practices, constraints and opportunities in the Member States.*

5.2 Recommendations to the BREF Technical Working Group

- 1. It is recommended that The BREF should include consideration of BAT and best practice in manure management/spreading.*
- 2. It is recommended that the BREF TWG undertake a detailed examination of the different types of air abatement systems, examining their effectiveness in comparison with other techniques to reduce emissions (including over time and with respect to the size of the farm) and the costs of such systems.*
- 3. The BREF TWG should seek to quantify the reductions in odour that can be achieved by different techniques and how these can be used separately or in combination to give different desired outcomes.*
- 4. It is recommended that the BREF TWG, in revising the BREF, pay particular attention to recommendations for how its conclusions on BAT can be translated into practical permit conditions.*
- 5. It is recommended that permitting authorities establish some critical conditions related to housing in such a way that compliance can be complied with.*
- 6. It is recommended that integrated assessments of techniques to control emissions to different aspects of the environment are made and that these approaches are shared between Member States and used by the BREF TWG.*

5.3 Recommendations to IMPEL

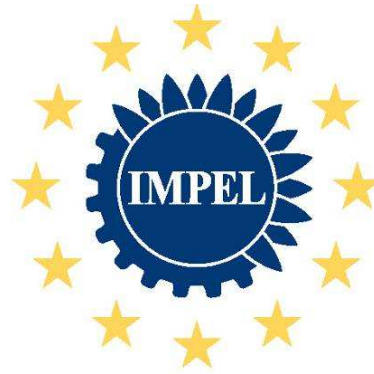
- 1. It is recommended that IMPEL maintains an information exchange forum in order to facilitate exchange of practical experience on the regulation of pig farms by its members.*

5.4 Recommendations to IMPEL members and other national authorities

- 1. It is recommended that Member State authorities share further experience of how to integrate regulatory and environmental objectives in improving the environmental performance of pig farms and related activities.*
- 2. It is recommended that IMPEL members seek ways better to integrated actions across the regulatory cycle and share experience on this, particularly on linking permitting and inspection actions.*
- 3. It is recommended that Member States should adopt integrated approaches to manure management - from production to spreading. IMPEL members should exchange further experience on opportunities and constraints in doing this.*
- 4. It is recommended that authorities identify the key obligations that will arise from implementation of the Water Framework Directive and ensure these are integrated with obligations on farmers with regard to manure spreading.*

5. *It is recommended that IMPEL members exchange further information on experience on upgrading requirements for older farms and, in particular, the justification for these decisions.*
6. *It is recommended that IMPEL members exchange further experience on the types of detail on housing set out in permit conditions and how these can be used in compliance assessment.*
7. *It is recommended that permitting authorities should consider establishing some conditions in permits to ensure that critical requirements related to housing are defined in such a way that compliance can be assured.*
8. *It is recommended that those authorities/Member States which require the use of air abatement systems undertake further analysis of the effectiveness and costs of different systems and how these compare for different farm types. This information should be made available to all IMPEL members.*
9. *It is recommended to include in the permit a requirement for operators to make an odour management plan, including all aspects of pig farm operation from production to manure spreading.*
10. *It is recommended that further work is undertaken to establish the relationship between feed type and odour production.*
11. *It is recommended that IMPEL members exchange experience in the setting of conditions regarding odour that can be effectively checked during inspection and are enforceable.*
12. *It is recommended that permitting authorities ensure that all permits set out all of the conditions necessary for the farm to avoid environmental problems and that these are clear enough so that compliance can be assessed.*
13. *It is recommended that permits are written in as simple and clear a way as possible, particularly that all compliance conditions are clearly set out, without recourse to cross-reference to annexes, etc.*
14. *It is recommended that inspectorates identify ways to undertake occasional checks to ensure that record keeping by IPPC operators and farmers spreading manure is accurate.*
15. *It is recommended that Member State authorities establish practical working relationships with other inspectorates, where necessary, to enhance the effectiveness and scope of inspection activity. Exchange of experience on this between IMPEL members would be welcome.*
16. *It is recommended that inspectorates work closely with permitting authorities (where these are separate) to provide feed-back on how to ensure that permit conditions are set in such a way that they can be properly assessed during inspection and, therefore, that compliance can be determined.*

17. *It is recommended that relevant Member State authorities develop plans for on-site inspection of selected farms during manure spreading in order to ensure spreading plans are complied with.*
18. *It is recommended that IMPEL members identify key information sources (e.g. national guidance, permits, etc.) that would be useful for other members to benefit from.*



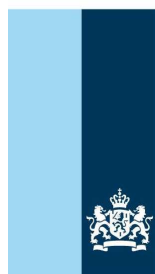
European Union Network for
the Implementation and Enforcement
of Environmental Law

IMPEL Project:

Comparison Programme on Permitting and Inspection of IPPC Pig Farming Installations in IMPEL Member Countries

Annexes to the Main Report

October 2009



VROM-Inspectie
Ministerie van Volkshuisvesting,
Ruimtelijke Ordening en Milieubeheer

Interprovinciaal Overleg **ip**^o

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Annex 1

Key environmental issues concerning IPPC pig farms identified by IMPEL members

The BREF for intensive rearing of poultry and pigs indicates manure to be the central environmental issue. The quality and composition of the manure and the way it is stored and handled are the main factors determining the emission levels of intensive livestock production. Environmental issues such as waste, energy, water and waste water, and noise are also addressed in the BREF, although in lesser detail. Ammonia has been given most attention as the key air pollutant, mostly emitted from housing and manure storage. Other environmental impacts relate to nitrogen and phosphorus emissions to soil, surface water and groundwater, and result from the application of manure to land.

In the BREF the next environmental problems are identified:

- acidification (NH₃, SO₂/NO_x)
- eutrophication (N,P)
- reduction of ozone-layer (CH₃Br)
- increase of greenhouse effect (CO₂, CH₄, N₂O)
- dessication (groundwater use)
- local disturbance (noise, odour)
- diffuse spreading of heavy metals and pesticides.

Respirable dust (small dust particles) are hardly mentioned in the BREF. Only recent insight shows respirable dust as an environmental problem, especially in areas with high livestock densities.

The amount of ammonia gas emitted directly from the housing system is more than substantial. Over 95% of the ecosystem area in both Western and Eastern Europe receive nitrogen deposition in excess of their critical loads¹. For instance in the Netherlands, 15% of the ammonia concentration is imported from abroad. This makes ammonia a cross-border problem. Odour from animal housing is a local problem, but is becoming increasingly important as the livestock industry expands and as increasing numbers of rural residential developments are built in traditional farming areas. This problem mostly occurs in densely populated areas.

Ammonia gas (NH₃) and odour are emitted directly from the housing system. This means that the type of housing system is of great importance. In pig farming there are large differences in pig housing systems between countries as well as within countries. The BREF presents the techniques that are BAT (Best available technique). Mostly, these techniques are housing systems, but also nutritional techniques are presented. Besides those techniques, good agricultural practice is an essential part of BAT.

Issues brought in by Member States

The following table presents the environmental issues in pig farming brought in by Member States, together with practical examples of experienced difficulties.

¹ IIASA, *Baseline emission projections for the revision of the Gothenburg protocol up to 2020*, sep 2008.

Member State	Key environmental issue	Example of practical difficulties experienced
CYPRUS (Costas Voskos)	Odour	In Cyprus the unpleasant odour from the pig-farms is important environmental problem. This is due to: <ul style="list-style-type: none"> • The close proximity of the pig farms to residential areas • The dense concentration of large pig farms within some areas.
CYPRUS (Costas Voskos)	The quality and the composition of effluent	The high concentrations of salts in the slurry causing problems in the use of slurry as fertiliser or for irrigation. A method to reduce the salinity, such as reverse osmosis, has very high energy costs and produces brine which is difficult to dispose.
CYPRUS (Costas Voskos)	The high density in pig population in certain areas	The large volumes of waste produced cannot be applied on land due to insufficient available agricultural areas for spreading. The size and the isolation of Cyprus as well as the close proximity residential areas and water abstraction boreholes has forced the authorities to set as Best Available Techniques the anaerobic and aerobic slurry treatment (increasing the cost of production and the investment) for such treatment.
CZECH (Josef Kalis)	The actual problems solving of the environmental pollution from the livestock (pig) farming in the Czech Republic	Problems of the environmental pollution from the livestock farming are being solved in the Czech Republic about 12 years. Actually we are solving intensively problems of odour, greenhouse gas, ammoniac and noise resulting from the agricultural activities. In the frame of IPPC and good agricultural practices national system BAT of the ammoniac and greenhouse gas reducing is implemented using biotechnology preparations added into the feed, feed water, manure and slurry. After three years the ammoniac emissions have been reduced from agreed 80 kilo tonnes per year to 67 kilo tonnes. In the frame of IPPC the biotechnology preparations are resolved in pig and poultry farming.

Member State	Key environmental issue	Example of practical difficulties experienced
DENMARK (Lene Steffensen)	Acidification (NH ₃)	<p>There is a conflict between the Danish definition of BAT concerning pig housing systems and BAT according to BREF which makes the evaluation of the use of BAT in a project difficult.</p> <p>It can be difficult to evaluate which is the most important; reduction of the amount of emitted ammonia gas or pig welfare considerations. I.e. the use of litter (straw) in pig housing systems is considered to be a good choice concerning pig welfare but the emission of ammonia gas is high compared to other housing systems.</p> <p>Differences between the Danish BAT certification system and the BAT certification system in other European countries makes it difficult to evaluate housing systems that are BAT according the certification system in other member states.</p>
DENMARK (Lene Steffensen)	Eutrophication (N and P)	The Danish standard for the amount of crude protein and total phosphorus in pig feed is higher than the minimum levels according to BREF. Especially concerning total phosphorus in pig feed it is my opinion that use of phytase which is very common makes it possible to use lesser amounts of total phosphorus than the Danish standard without too high costs i.e. the minimum BAT levels according to BREF might be too low.
DENMARK (Lene Steffensen)	Odour (local disturbance)	Odour measurements.
GERMANY (Kerstin Elberskirch)	General	First of all I have to say, that some of the problems which are mentioned in the BREF are not really relevant for my work because they have no local effects and that's why they can not really connected to one single pig farming. So it is not clear for me which effects a single pig farming has on the reduction of ozone-layer or the increase of greenhouse effect. These are two points which must be considered in a more global context.

Member State	Key environmental issue	Example of practical difficulties experienced
GERMANY (Kerstin Elberskirch)	Local disturbance (especially odour, but also noise)	<p>In my work I have especially to check the emissions and the immissions of pig farming and the effects to the surrounding (settlements, neighbors, nature, biotopes). In the result of that for me the local disturbances are the main problem. So for me it is interesting how far the exhaust air treatment is required in other countries and which experiences other countries have with that. How to evaluate expertises and which requirements are important in expertises. Do the expertises fit the real situation ? I know from experts that it is really difficult to make expertises for big pig farming with exhaust air treatment which fit the real situation.</p> <p>So I have for instance two different examples, one without exhaust air treatment but with pooled air flow. And although while the procedure of the approval the public had extreme oppositions now the situation is o.k. Another example is one pig faming which has an exhaust air treatment but nevertheless there are many complaints.</p> <p>Sometimes we have also complaints about the noise in connection with the transports especially during nights.</p>
GERMANY (Kerstin Elberskirch)	Eutrophication	<p>Another Problem is the evaluation of the possible eutrophication of the pig farming. In Germany we are testing a guideline for that evaluation with respect to nitrogen. But there are some open questions especially how to deal with critical loads and how to evaluate the biotopes correctly with respect to their sensitivity to nitrogen.</p>

Member State	Key environmental issue	Example of practical difficulties experienced
GERMANY (Kerstin Elberskirch)	All the problems which are connected with manure	The third main problem in my work are all the things which are connected with manure. Although the legal situation here is quite clear in Germany (because of the manure-law) about this subject are quite a lot of discussions especially with public. One problem is that with respect to the manure-law only the main nutrients are important. But for these the farmer has to prove that they do not concentrate in the soil. In Germany there is the point of view, that for the manure the farmer or the owner of the soil is responsible, but not the pig farmer. He has only to show that he has contracts with farmers to bring out the liquid manure. Is this enough? Which regulations and experiences therefore exist in other countries, especially faced to the soil and the groundwater?
GERMANY (Kerstin Elberskirch)	Germs and bioaerosols	I know this problem from my permission procedure. It is often mentioned in demurs and a lot of people are afraid of this. But in Germany there exists no real regulation or limit for germs and bioaerosols. How is it regulated in other countries?
HUNGARY (Edina Gampel)	Manure handling	Lack of insulated storage facilities for pig manure, soil and groundwater pollution as a consequence.
HUNGARY (Edina Gampel)	Manure handling	Manure storage facilities are usually not covered.
HUNGARY (Edina Gampel)	Manure handling	Capacity of manure storage facilities.
HUNGARY (Edina Gampel)	Odour	Installations situated close to inhabited areas.
HUNGARY (Edina Gampel)	Odour	Manure storage facilities are usually not covered.
NORTHERN IRELAND (David Bruce)	Availability of land for spreading slurry	Difficulty of providing adequate demonstration that slurry is being applied to land in accordance with crop nutrient requirements, in particular phosphorus ie. insufficient land available. Potential for alternative uses for slurry being considered.

Member State	Key environmental issue	Example of practical difficulties experienced
NORTHERN IRELAND (David Bruce)	Slurry storage	Majority of existing slurry storage in Northern Ireland is in deep tanks directly under the pigs with infrequent slurry removal. High cost implications to modify to systems of frequent slurry removal and shallow collection under pigs.
NORTHERN IRELAND (David Bruce)	Odour emissions	Significant number of odour complaints associated with some pig farms, largely to the scale of the operations and close proximity of third party dwellings. Potential for odour abatement (eg. scrubbers) being considered - cost prohibitive?
NORTHERN IRELAND (David Bruce)	Ammonia emissions	Potential for damage to designated habitats – ammonia monitoring being carried out around some pig farms and local habitats. Application of ammonia abatement technology - cost prohibitive?
ROMANIA (Manuela Florean)	Manure	Pig farming is an activity that develops continuously in the same sensitive nitrogen areas. Developers in most of the situations do not possess cultivated land for applying the result manure on, so they depend on a third person. When there is no demand of manure, the storage capacity is exhausted faster.
ROMANIA (Manuela Florean)	Odour	People who live in neighbourhood of farms are denouncing often the odour that disturb them. The owner of livestock has done everything that was in his power according with the IPPC License, but the odour persists and also the discontent of neighbours.
ROMANIA (Manuela Florean)	Animal tissue waste in case of epizooty	In case of epizooty the amount of animal tissue is very high; the inner burning device can't face it and the capacity of storage is depleted. The legislation does not allow the transportation of infected animal tissue in another location because there is danger of spreading the disease. It is necessary that the owner of livestock to find sustainable solutions to avoid environment deterioration.
SCOTLAND (Alasdair Knox)	Localised odour problems	One modern farm unit which appears to be operated to a high standard is subject of a large number of complaints relating to odour. It appears that the only option available to resolve the issue is the installation of odour abatement equipment. However the costs of this are significant. It would be useful to get some understanding of how this issue is being tackled elsewhere.

Member State	Key environmental issue	Example of practical difficulties experienced
SCOTLAND (Alasdair Knox)	Slurry handling and Storage	The Scottish pig industry relies heavily on deep pits under slats for the storage of slurry. The suggestion in the BREF that the industry should move away from this to other systems is being resisted. It would be particularly useful to know how others are handling this issue.
SCOTLAND (Alasdair Knox)	Site drainage and bio-security	The Scottish Environment Protection Agency (SEPA) has recently released fresh guidance to operators relating to surface water drainage. In short operators are being asked to ensure that their drainage is treated by way of a constructed farm wetland or other 'natural' treatment system prior to discharge to the water environment. However although this appears to be the best method of improving water quality around installations the public body responsible for disease control has raised objections on the grounds of bio-security specifically the danger of attracting wild fowl carrying bird-flu to premises. It would be useful to get the experience of other participants in dealing with surface water runoff.
SLOVENIA (Romana Šumak)	Land spreading of manure/slurry from pigs	Groundwater pollution, designated vulnerable zones, nutrient overload problems.
SLOVENIA (Romana Šumak)	On-farm manure processing - waste water treatment	Nitrogen and phosphorus emissions to surface water.
SLOVENIA (Romana Šumak)	Ammonia emissions / odour to air from pig housing systems	Complaints, lack of national legislations (odour).
SLOVENIA (Romana Šumak)	On - farm pig manure processing – anaerobic treatment of manure in biogas installations	Complaints, odour.

Annex 2: The Questionnaire

Please answer the following questions:

Contextual information

1. Please give your name(s) and contact details and indicate your position/expertise	
2. Please give the name of your organisation	
3. What territory does your organisation cover?	

Regulatory framework

Please answer the following questions:

4. How many pig farm IPPC installations are the responsibility of your competent authority?

Answer:

5. Are other competent authorities in your area involved in the regulation of pig farms under IPPC? If so, which authorities and how are responsibilities divided?

Answer:

6. What types of 'directly associated activities' have been included in the scope of permits? Is the determination of 'directly associated activities' an issue?

Answer:

7. Have you developed guidance for operators specifically to support the implementation of IPPC by pig farmers? What does this cover? How does this guidance take account of the contents of the BREF?

Answer:

8. Have General Binding Rules been used for the permitting of farms? Which environmental issues do they cover for what sizes of farms? At what level are such rules set, e.g. regional / national?

Answer:

Applying for a permit

Please answer the following questions, indicating in particular the use of the BREF on the intensive rearing of poultry and pigs in the application process:

9. In the permit application process, what information does the permitting authority require on manure storage? How do operators assess issues relating to manure storage? Are there particular concerns about assessment of manure storage by permitting authorities?

Answer:

10. In the permit application process, what information does the permitting authority require on manure spreading on land? How do operators assess issues relating to manure spreading on land? Are there particular concerns about assessment of manure spreading on land by permitting authorities?

Answer:

11. In the permit application process, what information does the permitting authority require on animal housing systems? How do operators assess issues relating to animal housing systems? Are there particular concerns about assessment of animal housing systems by permitting authorities?

Answer:

12. In the permit application process, what information does the permitting authority require on air abatement techniques? How do operators assess issues relating to air abatement techniques? Are there particular concerns about assessment of air abatement techniques by permitting authorities?

Answer:

13. In the permit application process, what information does the permitting authority require on odour? How do operators assess issues relating to odour? Are there particular concerns about assessment of odour by permitting authorities?

Answer:

14. Are there any other concerns about or issues raised in the permit application process?

Answer:

Determining permit conditions

Please answer the following questions, indicating in particular the use of the BREF on the intensive rearing of poultry and pigs in the permit determination process:

15. What types of conditions have been established in permits relating to manure storage? Are there any problems/issues concerning the setting of permit conditions on this issue?

Answer:

16. What types of conditions have been established in permits relating to manure spreading on land? Are there any problems/issues concerning the setting of permit conditions on this issue?

Answer:

17. What types of conditions have been established in permits relating to animal housing systems? Are there any problems/issues concerning the setting of permit conditions on this issue?

Answer:

18. What types of conditions have been established in permits relating to air abatement techniques? Are there any problems/issues concerning the setting of permit conditions on this issue?

Answer:

19. What types of conditions have been established in permits relating to odour? Are there any problems/issues concerning the setting of permit conditions on this issue?

Answer:

20. Are there any other concerns about or issues raised in setting permit conditions?

Answer:

Monitoring and reporting

Please answer the following questions indicating in particular the use of the BREF on the intensive rearing of poultry and pigs in the setting of monitoring and reporting requirements:

21. Are there specific monitoring and reporting requirements relating to manure storage? Are there issues for operators in meeting these requirements? Do the authorities have sufficient tools to demand monitoring and reporting?

Answer:

22. Are there specific monitoring and reporting requirements relating to manure spreading on land? Are there issues for operators in meeting these requirements? Do the authorities have sufficient tools to demand monitoring and reporting?

Answer:

23. Are there specific monitoring and reporting requirements relating to animal housing? Are there issues for operators in meeting these requirements? Do the authorities have sufficient tools to demand monitoring and reporting?

Answer:

24. Are there specific monitoring and reporting requirements relating to air abatement techniques? Are there issues for operators in meeting these requirements? Do the authorities have sufficient tools to demand monitoring and reporting?

Answer:

25. Are there specific monitoring and reporting requirements relating to odour? Are there issues for operators in meeting these requirements? Do the authorities have sufficient tools to demand monitoring and reporting?

Answer:

26. Are there any other concerns about or issues raised concerning monitoring and reporting?

Answer:

Inspection

Please answer the following questions:

27. Are pig units subject to any particular frequency of inspection? If so, what? How has this been determined?

Answer:

28. Are inspections on manure storage carried out? How? On which issues will the inspection focus, e.g. specific operational aspects, emissions or other impacts? In case of non-compliance, what are the main issues? What further actions will the authorities undertake to enforce compliance on this issue?

Answer:

29. Are inspections on manure spreading on land carried out? How? On which issues will the inspection focus, e.g. specific operational aspects, emissions or other impacts? In case of non-compliance, what are the main issues? What further actions will the authorities undertake to enforce compliance on this issue?

Answer:

30. Are inspections on animal housing carried out? How? On which issues will the inspection focus, e.g. specific operational aspects, emissions or other impacts? In case of non-compliance, what are the main issues? What further actions will the authorities undertake to enforce compliance on this issue?

Answer:

31. Are inspections on air abatement techniques carried out? How? On which issues will the inspection focus, e.g. specific operational aspects, emissions or other impacts? In case of non-compliance, what are the main issues? What further actions will the authorities undertake to enforce compliance on this issue?

Answer:

32. Are inspections on odour carried out? How? On which issues will the inspection focus, e.g. specific operational aspects, emissions or other impacts? In case of non-compliance, what are the main issues? What further actions will the authorities undertake to enforce compliance on this issue?

Answer:

Any other issues

33. Are there any other issues that you would like to raise with regard to the practical application of IPPC to pig farms?

Answer:

Thank you for completing the questionnaire!

Annex 3:

Summary of Responses to the Project Questionnaire to IMPEL Members

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1. INTRODUCTION

The questionnaire generated 26 responses, with input from 26 authorities across 17 Member States. Some responses were received from national level authorities, some from large regional authorities and some from local authorities. The type of authority also varied in their involvement with IPPC regulation of pig farms, for example with some involved in permitting, some inspection and some in all regulatory aspects. This variation is reflected in the experience of the authorities as set out in their responses to the questionnaire (e.g. whether they are involved in developing national guidance or the number of IPPC pig farm installations they regulate).

The following table provides a breakdown of the authorities which responded to the questionnaire. For ease of reference an abbreviation is provided for each respondent which is used in many of the tables provided later in this report. On occasion an abbreviation for the Member State alone may be used.

Respondent	Abbreviation
Cyprus , Environment Service, Ministry of Agriculture, Natural Resources and Environment	CY-E
Cyprus , Ministry of Labour and Social Insurance, Department of Labour Inspection	CY-L
Czech Republic , Czech Environmental Inspectorate	CZ
Denmark , Natur og Miljø (Department of nature- and environmental protection), Holbæk Kommune (Holbaek Municipality)	DK-H
Denmark , Natur- og Miljøforvaltningen, Vejle Kommune	DK-V
Estonia , Estonian Environmental Inspectorate (West Region)	EE
France , Direction Départementale des Services Vétérinaires, Ministry of Agriculture	FR
Germany , LUA Brandenburg	DE-B
Germany , Regierungspräsidium Kassel	DE-K
Germany , LMS Landwirtschaftsberatung Mecklenburg-Vorpommern/Schleswig-Holstein GmbH	DE-L
Germany , Staatliches Amt für Umwelt und Natur, Neubrandenburg	DE-N
Germany , Staatliches Amt für Umwelt und Natur, Schwerin	DE-SC
Germany , StAUN Stralsund Abt. Immissions- und Klimaschutz, Abfall und Kreislaufwirtschaft, Stralsund	DE-ST
Hungary , National Inspectorate for Environment, Nature and Water	HU
Ireland , Environmental Protection Agency	IE
Latvia , State Environmental Service	LV
Netherlands , Provincie Flevoland	NL-F
Netherlands , Provincie Gelderland	NL-G
Netherlands , SenterNovem - InfoMil	NL-I
Poland , Voivodship Inspectorate for Environmental Protection in Szczecin, Western Pomeranian Voivodship	PL

Portugal , Portuguese Environmental and Spatial Planning General Inspectorate (IGAOT)	PT
Romania , Ministry of the Environment- National Environmental Guard-Hunedoara County Commissariat	RO
Slovakia , Regional Environmental Inspectorate in Žilina	SK
Slovenia , Inspectorate of Republic of Slovenia for Environment and Spatial Planning (IRSOP)	SI
Sweden , County of Halland and County of Västra Götaland	SE
United Kingdom , Environment Agency, England and Wales	UW-EW
United Kingdom , Northern Ireland Environment Agency, Northern Ireland	UK-NI
United Kingdom , Scottish Environment Protection Agency, Scotland	UK-SC

2. REGULATORY FRAMEWORK

2.1 Numbers of IPPC pig farm installations

Question asked:

How many pig farm IPPC installations are the responsibility of your competent authority?

The number of pig farms varies significantly across the Member States. The numbers in the table below indicate the total which are the responsibility of the competent authority which completed the questionnaire. Some respondents represent national regulators responsible for all IPPC installations, others are local regulators. Therefore, the numbers reflect this. Most are IPPC installations, but this is not necessarily always the case. The number of IPPC pig farms regulated by a competent authority will affect issues of expertise in the authority and capacity to address permitting, inspection, etc.

Member State/authority	Number of pig farm IPPC installations which are the responsibility of the competent authority
CY	37
CZ	170
DE – B	19 (16 are IPPC)
DE - K	3 (6 further planned)
DE – N	29
DE – SC	37
DE – ST	16
DK- H	30
DK – V	35
EE	14
FR	50
HU	312 (regions have from 1 to 63 farms)

IE	90-100
LV	28
PL	26
PT	35
RO	105
SE	12 (Halland) and 22 (Västra Götaland)
SK	4
SI	7
UK- EW	180
UK- NI	13
UK- SC	23

Further information on the number of IPPC pig farms (IPPC Annex I categories 6.6b and 6.6c) can be found from studies on the review of permitting progress for IPPC installations undertaken by DG Environment. The following table extracts the data from the most recent study which identifies the date for which the Member States provided the data to the Commission and the total number of IPPC pig farms reported for EXISTING installations as defined by the Directive. Note that this does not include NEW installations and that Denmark did not provide sufficient data to identify the number of pig farms. The numbers of pig farms vary significantly, from zero or very few in some Member States, to many hundreds in Spain, the Netherlands and Italy. Across the EU there are more than 5,500 IPPC pig farms according to these data, but if Danish and all new installations are included, this could rise to over 6,000.

Member State	Date data submitted (Month/year)	Total IPPC pig farms (6.6b,c) as existing installations
Austria	04/2008	0
Belgium	various 2008	196
Bulgaria	06/2008	42
Cyprus	10/2007	34
Czech Republic	04/2008	196
Denmark	04/2008	Data not provided
Estonia	10/2008	34
Finland	04/2008	24
France	10/2007	309
Germany	12/2008	601
Greece	07/2008	11
Hungary	04/2008	289
Ireland	04/2008	89
Italy	04/2008	675
Latvia	10/2007	24
Lithuania	12/2007	28
Luxembourg	04/2008	1
Malta	10/2007	0

The Netherlands	10/2008	856
Poland	04/2008	122
Portugal	07/2008	98
Romania	10/2007	58
Slovakia	10/2007	43
Slovenia	07/2008	9
Spain	10/2007	1455
Sweden	04/2008	117
United Kingdom	04/2008	214
Total	n/a	5525

2.2 Competent authorities for regulation of IPPC pig farms

Question asked:

Are other competent authorities in your area involved in the regulation of pig farms under IPPC? If so, which authorities and how are responsibilities divided?

The institutional arrangements for the regulation of pig farms varies significantly across the Member States. Some Member States restricted answers only to the direct responsibilities for the implementation of IPPC, others included authorities responsible for many other aspects of the performance of pig farms. Only a short over-view is appropriate here.

With regard to the implementation of IPPC, authorities in a number of Member States indicated that they were entirely, or largely, responsible for all aspects (from permitting to inspection) of regulation (**Denmark, France, Hungary, Ireland, Sweden, United Kingdom**). Where the main IPPC competent authority is either a regional or local authority or a regional or local office of a national authority, the national body (usually a ministry) has an oversight and advisory function. Note that in **France** the service of the Veterinary Direction prepares permits and undertakes inspection, although the Préfet (at the Département level) issues the permit after the advice of an environmental commission.

In other Member States there is a separation of regulatory functions in IPPC implementation, such as between permitting and inspection, or in the issuing of permits, so that more than one authority is responsible (**Cyprus, Czech Republic, Estonia, Germany, Netherlands, Poland, Portugal, Romania**). In some cases this separation can be at the same administrative level (e.g. national in **Cyprus** and regional in **Poland**) or at different administrative levels (e.g. **Czech Republic**). For example, in the **Netherlands**, competent authorities for permitting are the Municipality or the Province (where the installation includes the production of feed from waste products). For discharge of waste water on surface water, the “Waterschap” (District Water Board) is the competent authority and for spreading manure on land, the “Algemene InspectieDienst (AID)” (General Inspectorate) is responsible.

These differences are important in considering how far the key environmental issues arising from pig farm activity are addressed through the regulatory chain, including issues of communication between authorities. For example, if the same institutions, or even individual, sets conditions in a permit relating to key environmental issues and is responsible for inspection, this presents a different context for inspections of permit conditions compared to cases where these are undertaken by separate bodies.

Respondents also stressed the role of other authorities in pig farm regulation:

- Ministries of agriculture – often responsible for regulations and controls on manure spreading, aspects of animal housing, etc. Sometimes one or more of these issues might be devolved to an agency of the Ministry or a local body
- Veterinary authorities – responsible for animal health and welfare issues
- Local authorities – responsible for local community interests and planning controls (sometimes a separate authority)
- Nature conservation bodies – responsible for nature protection with interests in pollution impacts on habitats and species
- Occupational safety authorities
- Trade authorities

2.3 Directly associated activities

Question asked:

What types of 'directly associated activities' have been included in the scope of permits? Is the determination of 'directly associated activities' an issue?

The IPPC Directive requires that directly associated activities of an installation be included within the scope of permitting. However, this can be difficult to define, but it can have a significant effect on controlling some of the environmental impacts of those installations.

Respondents varied in their response to the question and, indeed, some interpreted the question as referring to the types of activity or output to be regulated. Others considered the specific nature of a directly associated activity as indicated by the Directive. Examples of the range of directly associated activities indicated by those respondents is given in the table below.

Many specifically include aspects of manure storage and handling. Also included are waste water treatment, feed mills, storage of hazardous substances, incinerators and other ancillary activities.

Importantly, some stress that directly associated activities were deemed to be within the scope of a permit if the activity takes place on the same site (e.g. manure spreading). **Slovenia** notes that the activity can be owned by another legal person, in which case a contract has to be formulated between them and the operator receiving the permit. In

France if the same owner has several sites, the inspection service checks if there is a “common means” between them, with manure spreading being the most common link.

Some authorities, e.g. **Hungary**, note that the definition of what is a directly associated activity proved controversial as IPPC was initially implemented and **Ireland** notes that inclusion of feed mills and feed mixing within the permit is controversial with a minority of operators. A number of authorities have issued guidance (sometimes based on that produced at EU level) on interpreting what is an ‘installation’ and, therefore, on what are directly associated activities.

Member State/authority	Directly associated activities
CY	Slurry treatment Storage and disposal of manure or sludge from treatment
CZ	Manure spreading, good agricultural practice
DE – L	Storage of organic fertilisers Application of fertilisers
DE-NB	Manure storage, manure and slurry handling Waste handling Feed mills Biogas installation Management of harmful substances
DK- H	Waste handling
DK – V	Waste handling Transport
EE	Waste water Waste handling Slurry spreading
FR	Animal husbandry Manure spreading Biogas, etc
HU	Boilers Animal feed mixing Drying Storage of crops Storage of chemicals and pharmaceuticals Temporary storage of hazardous waste and carcasses Maintenance of machinery Manure handling
IE	Feed mills/ feed mixing Slurry and manure storage Slurry separation and treatment
LV	All which can have an influence on emissions
PL	Processes of preparation and transportation of fodder (silos for fodder storage, corn drying-chamber) Slurry treatment and manure storage (downstream manure collecting system, slurry channels, pumping station for liquid manure transportation, lagoons and slurry tanks)

	Manure management (land spreading, sending of the farm etc.) Exhaust ventilation system Waste handling (storage of waste, scrap materials and containers for animal carcasses) Storage of medicines, disinfectants, coals Heating (heaters in pigsties, boiler house); Electricity (wiring system, transformer station) Water supply (water network, water tower or water containers for water leveling) Collecting of wastewaters (wastewater collecting system, septic tank)
PT	Incineration units for carcasses Waste water treatment, manure or sludge spreading
RO	Cultivation of arable land
SE	Cultivation and fertilisation of arable land, including manure spreading
SK	Storing manure Management of harmful substances, e.g. oil Heating Treatment of waste water
SI	Storage and disposal of manure or sludge from treatment Waste water treatment (if same site) Biogas installation (if same site)
UK- EW	Carcass incinerators Effluent treatment plants Feed mills Anaerobic digesters Biomass burners Associated livestock Slurry lagoons
UK- NI	Feed milling and handling Slurry and manure storage Operation of constructed wetlands Carcass incinerators Fuel storage
UK- SC	Feed storage and handling Handling slurries and manures (if same site) Fuel storage Drainage arrangements Waste handling

2.4 Guidance for the implementation of IPPC by pig farms

Question asked:

Have you developed guidance for operators specifically to support the implementation of IPPC by pig farmers? What does this cover? How does this guidance take account of the contents of the BREF?

Many respondents indicate that no specific guidance has been produced to support the implementation of IPPC by pig farms.

However, some Member States have issued guidance for pig farms. In many cases it is stated that this is based on the BREF. However, occasionally such guidance was produced prior to BREF publication. In other cases, the guidance is still being finalised. The guidance produced includes:

- In **Cyprus** the guidance includes good agricultural practice, efficient use of energy and water, nutritional management, slurry management (i.e. collection, treatment, storage, disposal and land application), management of other waste (carcasses) and reduction in noise.
- In **Estonia** guidance has been produced in co-operation with Danish experts on permit application processes, including assessment of BAT and environmental impacts.
- In **France** a “technical summary” of the BREF for operators was developed by an professional agricultural organisation and other supporting documents are being prepared by a joint professional/administration working group.
- In **Germany** guidance as such is not produced. However, national regulations set out detailed requirements relating to pig farm operations which take the place of guidance. The Box below summarises the issues addressed in relevant regulations.
- In **Hungary** the first national BAT guidance notes were developed in 2002. One of the first two was guidance on pig farming. When preparing the guidance note, the relevant content of the BREF, the specific issues of the pig sector in Hungary, and British practical experience were taken into account. The contents of the guidance note are set out in the Box below.
- In **Ireland** a draft BAT note, which refers significantly to the BREF, has been issued for consultation and comments have been received back from the sector and interested parties.
- In the **Netherlands** for each BREF a so called “oplegnotitie” (literally: impose note) has been developed (including one for pigs and poultry), in which the relation between BREF and existing national regulations is explained.
- In **Poland** on-line tools have been developed to support many aspects of IPPC implementation (see <http://ippc.mos.gov.pl/ippc/>). This includes a special guidebook on the application of BAT and the web site contains reference to further Polish and EU information, including specific obligations for pig farmers.
- In the **UK** (England and Wales) there is a technical guidance document called ‘How to Comply 2006’, which is due to be revised in 2009 to bring it in line with generic guidance for other IPPC sectors. It details the permit conditions and the appropriate measures that should be used to comply with each condition and meet the requirements for BAT and is based on the contents of the BREF. Relevant details on housing types are in the Appendices and references given for further information.
- In the **UK** (Northern Ireland) a number of guidance documents have been produced to cover various aspects of IPPC implementation, e.g. odour management/noise management; water/waste audits; dietary management; slurry/manure management; treatment of site run-off; BAT review of existing housing design/management; example/template permit applications for new farms or permit variations. These

documents provide guidance on what needs to be done to meet the requirements of IPPC and make reference to BAT (i.e. BREF) requirements where applicable.

- In the **UK** (Scotland) the Scottish Environmental Protection Agency (SEPA) has issued its Standard Farming Installation Rules (SFIR), which set out its view of BAT. The guidance covers: storage and handling of livestock manures and slurries; emissions from point sources to air water land including treatment of site runoff; emissions from diffuse sources; energy efficiency; waste management; odour; noise; livestock diet; housing design and management and incident prevention. Some parts of this document are better developed than other areas, but it is being improved in stages as the regulator focuses on various aspects of farm operation. The document draws on the BREF and other sources including domestic legislation and codes of good practice.

A number of respondents (e.g. **Latvia** and **Slovakia**) note that general guidance for IPPC operators has been produced, although not specific to pig farms and others (**Czech Republic; Romania; Sweden**) and they may also refer to general guidance on good agricultural practice or similar documents that should be adhered to, although not specific to IPPC. **Portugal** also notes that although guidance is not produced, technical and other information meetings, etc., have been organised with operators in order to transfer understanding of IPPC requirements. Similar activities are probably undertaken in other Member States, supported, where appropriate, by guidance documents.

Germany: Details in national and regional regulations relating to pig farms

The Bundes-Immissionsschutzgesetz (BImSchG) and TA Luft are national regulations and set out BAT. They state that if the issues they cover are not complete, reference should be made to the BREF. TA Luft contains the following regulations for pig farming in particular:

- Minimum distance to houses and sensitive ecosystems
- Special construction and operational measures to reduce emissions
- Minimum capacity for the storage of manure: 6 months
- Storage of manure in closed basins
- Evaluation of the ammonia and nitrogen deposition
- Maximum emission value for dust
- A model for calculation of pollutant dispersion

Geruchs-Immissionsrichtlinie (GIRL M-V) is guidance produced only for the region of Mecklenburg-Vorpommern. It contains regulations to evaluate the odour concentrations which are calculated with the model set out in the TA Luft. This allows for odour to be noticeable for up to 10-15% of the time in neighbouring villages. Similar regulations exist in all federal states of Germany.

For the evaluation of noise there is national regulation of the TA Lärm.

To address manure application there is the national regulation of the

manure/fertilization law. This covers regulations such as the principles of manure spreading, i.e. not to apply on the soil if the soil is frozen, overflowed, waterlogged etc., to stop the output of manure 3 m in front of the embankment of running or standing water (if the manure can run down, the distance has to be 20 m) and, e.g. not to bring apply from November 1st to January 31st. The manure law also covers regulations about the kind of manure, allowed amounts of nutrients, etc. It also contains information about techniques which are not BAT.

Tierschutz-Nutztierhaltungsverordnung is a national regulation which covers the requirements of EU Directive 91/630 and EU Regulation 2001/88.

There is also a water law (partly national, partly only for the federal state of Mecklenburg-Vorpommern) and a national soil law. Both contain requirements for soil and water protection, including control of substances entering waters.

Hungary: Structure of the national BAT guidance for pig farms

General Information

Introduction, Application of BAT to New and Existing Plants, Application Deadlines and Review Periods, Technical Aspects of an Application, Installations Covered, Key issues for the Sector, Typical housing systems in Hungary, Emissions from intensive rearing of pigs

Information on the Best Available Techniques Applied

Siting considerations, Intensive pig rearing process, Materials, water and energy, Techniques for minimizing emissions, Waste and wastewater management, Manure and slurry management, Other techniques, Animal health and disease control aspects, Monitoring

Emission Limit Values

Emissions to air, soil and groundwater, surface water and sewage systems, noise emissions

Environmental Impact

Useful Websites

Annex I: List of Relevant Regulations

Annex II: Comparison of IPPC with other Environmental Permitting Procedures

Comparison of the content requirements of environmental impact assessment documentation, the comprehensive environmental audit documentation and the IPPC permit application

Annex III: Reference Emission Levels

2.5 General binding rules

Question asked:

Have General Binding Rules been used for the permitting of farms? Which environmental issues do they cover for what sizes of farms? At what level are such rules set, e.g. regional / national?

General binding rules (GBRs) are obligatory conditions set out at national or regional level setting conditions for the operation of all or part of an installation instead of determining permit conditions on a case by case basis. Some Member States have routinely set out conditions for IPPC installations in regulations and this also applies to pig farms. It is not always clear if GBRs are used. However, some GBRs may apply to implement other Directives (e.g. nitrates or groundwater) or there may be some general obligations in national law on air monitoring, etc. These are not included in this analysis as they are not specifically focused on IPPC pig farming permit requirements.

Member States which have not adopted GBRs include: **Cyprus, Ireland, Latvia, Romania, Sweden, UK** (England and Wales) and **UK** (Scotland) (in **Portugal** there is an GBR, but is not full in use as yet).

A range of GBRs relevant to IPPC pig farms have been adopted. No Member State has adopted a GBR covering all aspects of IPPC permitting for pig farms (although probably that in **UK** (Northern Ireland) comes closest). Rather they address specific issues such as individual emission limits. Examples of GBRs that are used include:

- In the **Czech Republic** there is national legislation which sets obligations relating to BAT, including in relation to agriculture.
- In **Estonia** there are national obligations with respect to water which act as a GBR.
- In **France** there are national rules (ministerial order 7th/02/2005) for all the authorised farms (more than 450 pigs). These rules cover all the impacts on the environment and the vicinity (included the manure spreading conditions).
- In **Germany** there is a range of national and regional legislation setting out emission limit values and/or standards for the operation of installations which act as GBRs covering, together, all aspects of pig farm operation. Details of examples of such laws are given in the Box accompanying the section above on guidance.
- In **Hungary** the law allows the possibility of laying down GBRs. These are technological emission limits, and they specify the minimum requirements to be fulfilled. Most of the legislation which established these GBRs is media-based and super-sectoral, e.g. for air pollution control including odour nuisances, surface and groundwater, soil protection, waste management and noise abatement. There is no GBR for a specific sector such as pig farming. Pig farms with smaller capacity than the IPPC threshold have to comply with less strict rules. GBRs are defined at national level. There is a possibility for the permitting authority to apply stricter rules than those laid down in the GBR, if the state of the environment at that specific locality requires it. A list of the most important GBRs relevant to IPPC pig farms is provided in the Box below.
- In the **Netherlands** IPPC is implemented in national laws concerning permitting. These set some conditions, but where there are local problems additional obligations may be required as set out the in 'impose note' for the BREF.
- In **Poland** GBRs are adopted on the national level in the form of the legal provisions, mainly the ministerial decrees with detailed restrictions relating to emission level, etc. The Box below provides a list.

- In **Slovakia** there are requirements set out in national law regarding water protection and agricultural practice which act as GBRs.
- In **Slovenia** national legislation sets emission limit values for emissions to air, waste water, noise and waste management. GBRs are obligatory conditions set out at national level setting conditions for the operation of all or part of an installation.
- The **UK** (Northern Ireland) has adopted “Standard Farming Rules” which are operated in a similar way to General Binding Rules. These rules cover most aspects of site operation with the exception of (a) where site specific conditions will be required, specifically for noise and odour (the exclusion of these emissions from the rules will enable the maximum number of installations to qualify for the Standard Farming Installation route) and (b) where improvement conditions are applied as the result of audits and reports required by the rules, or in order to comply with the rules. The rules can be used for all sizes of farm. Farms which cannot meet the requirements of the rules will have to apply for a non-standard IPPC permit and be subject to higher application and annual subsistence fees.

GBRs adopted in Hungary relevant to IPPC pig farms

Surface water

- Gov. Decree on the rules of surface water protection

Groundwater and soil

- Gov. Decree on groundwater protection
- Gov. Decree on ELVs necessary for groundwater and soil quality protection

Remediation

- KvVM Decree on the rules concerning remediation
- Gov. Decree on the rules of prevention and remediation of environmental damage

Air

- Gov. Decree on certain rules of air protection
- KöM-EüM-FVM joint Decree on air emission ELVs, ELVs for stationary air polluting point sources
- KöM Decree on technological ELVs for air polluting emissions from combustion facilities larger than 140 kWh but smaller than 50 MWh rated thermal input

Noise and vibration

- Gov. Decree on certain rules of environmental noise and vibration abatement
- KöM-EüM joint Decree on noise and vibration load ELVs

Waste management

- Gov. Decree on the conditions of carrying out activities concerning hazardous waste
- Gov. Decree on the conditions of carrying out activities concerning municipal solid waste
- Gov. Decree on record keeping and data reporting obligations concerning waste
- FVM Decree on the management of animal waste and the rules of placing on the market products made by recycling animal waste

Protection of waters against nitrate pollution from agriculture

- Gov. Decree on protection of waters against nitrate pollution from agriculture
- FVM Decree on the detailed rules of the action plan necessary for the protection of

waters against nitrate pollution from agriculture, and the rules of record keeping and data reporting

Livestock

- FVM Decree on the animal welfare

GBRs adopted in Poland relevant to IPPC pig farms

Wastes

- Act on Waste of 27 April 2001 (with further amendments).
- Decree of the Ministry of Environment of 27 September 2001 on catalogue of waste
- Decree of the Ministry of Environment of 11 December 2001 on documents needed for waste register.

Water quality and water protection

- Decree of the Ministry of Health of 19 November 2020 on requirements relating quality of drinking water for people
- Decree of the Ministry of Environment of 24 May 2004 on examples of information boards in the zones of water intake
- Decree of the Ministry of Environment of 11 February 2004 on classification of state of surface and underground waters, water monitoring, interpretation and presentation of results of water quality examination
- Decree of the Ministry of Environment of 8 July 2004 on conditions which should be met when discharging wastewaters into water body or soil and substances dangerous to water environment.

Manure storage and spreading

- The Act on fertilizers and fertilization of 26 July 2000 with amendments
- Decree of the Ministry of Agriculture and Rural Development of 16 April 2008 on detailed methods of fertilization and trainings on fertilizers use
- Decree of the Ministry of Environment of 23 December 2002 on detailed requirements which should be met by action programmes relating to reduction of nitrogen run off from agriculture sources.

Housing

- The Act on animal protection of 21 August 1997
- Decree of the ministry of agriculture of 7 October 1997 on requirements which should be met by agricultural buildings and their location
- Decree of the ministry of agriculture of 2 September 2003 on minimal conditions of farm animal housing

Reporting and environmental fees

- Decree of the Ministry of Environment of 15 December 2005 on models of registers including information and data on range of use of environment and on rate of due fees and ways of presentation of information and data

Emission

- Decree of the Ministry of Environment of 13 June 2003 on requirements relating to

measurements of emission level

- Decree of the Ministry of Environment of 5 December 2002 on reference values for some substances in air
- Decree of the Ministry of Environment of 9 September 2002 on quality standards for soil and earth

Noise

- Decree of the Ministry of Environment of 14 June 2007 on permissible noise level in environment

Other issues

- Decree of the Ministry of Environment of 26 July 2002 on installations which can cause significant pollution of environment
- Decree of the Ministry of Environment of 9 April 2002 on types and amounts of hazardous substances which cause that the enterprise where the substances are stored is considered as a plant of high risk or a plant of risk of serious industrial breakdown

3. APPLYING FOR A PERMIT

3.1 Applying for a permit and manure storage

Question asked:

In the permit application process, what information does the permitting authority require on manure storage? How do operators assess issues relating to manure storage? Are there particular concerns about assessment of manure storage by permitting authorities?

Authorities identified a wide range of types of information that can be asked for in permit applications relating to manure storage. These include:

- Information on the number, type, materials, capacity, age, floor structure, etc., of the manure stores.
- Methods to be used in filling, emptying, cleaning, etc., of manure stores.
- Methods to test and ensure storage integrity.
- Methods to be used to control and prevent pollution to air and water.
- Details on the type and content of the manure/slurry to be stored.
- Ancillary information: numbers of animals, distance to residential areas, etc.

The following table provides details on the information identified by each of the authorities in the questionnaire. Some issues overlap and it is likely that many of the responses are not comprehensive, identifying some critical elements. It is also not clear

whether all types of information are requested on every occasion or requested as necessary. It should also be noted that where applicants, particularly of existing installations, do not yet meet the requirements for manure storage, they are usually asked to provide information on how upgrading will take place. An example of the specific requirements in a permit application for **Poland** is provided in the Box below.

Information on manure storage, required by the permitting authority in Poland

Maximum theoretical capacity (productivity) of farm: The number of animals and animal units.

Animal production: Total production of livestock on the farm in tones per year.

Manure production: Predicted annual amount of manure. Calculations of mean annual amount of manure (according to expert judgment, the amount of generated manure is equal to 80% of water intake).

Units for manure storage: The storage capacity for manure should be enough for at least 6 months. (In practice it can be assumed that the volume of the manure tank should be 10 m³ per 1 animal unit). The total capacity of units for manure storage (such as manure channels, pumping station, slurry tanks and manure pad) should identified in the application as well as information on the technical state of appliances. The slurry tanks and other units should be tight to prevent against local pollution of groundwater and soil. The current control of manure level in the units can eliminate the danger.

Materials: Information should be provided on the construction material of slurry tanks and methods/techniques used for sealing units.

Methods of water protection: Methods of protection of water environment which are applied or to be implemented:

- Control of technical state of manure/slurry tanks;
- Routine maintenance of tanks;
- Minimizing the amount of contaminants washed away by rainwater by keeping the area clean;
- Control of technical state of manure channels;
- Monitoring of groundwater quality.

Methods of groundwater protection: Floor system applied in pigsties should be described: floor should be leak-proof and equipped with equipment which leads the manure to tight tanks.

Monitoring requirements: In an application there is a detailed description of proposed monitoring requirements relating to manure storage - the following issues should be

monitored:

- Amount of water intake and water consumption;
- Quality test of manure before agriculture application on land;
- Amount of manure spreading on land;
- Technical state of slurry tanks (keeping the register of repairs and controls);
- Technical state of manure channels;
- Number of animals on the farm;
- Animal livestock production;
- Amount and quality of fodder mixture;
- Number and types of events which can cause environmental danger.

The storage capacity of both manure concrete yards and slurry tanks is the main concern of permitting authorities.

Information required on manure storage	CY L	CY E	DE K	DE L	DE N	DE ST	DK H	DK V	EE	FR	HU	IE	LV	NL -G	PO	PT	SE	SI	SK	UK EW	UK NI	UK SC
General legal compliance														X								
Type of storage																X						
Units: number of					X		X								X							
Unit size				X	X		X	X		X							X					
Unit material					X		X	X														
Unit strength					X		X					X					X					
Unit capacity					X		X	X		X			X		X	X	X				X	X
Unit location	X		X		X		X										X					X
Unit: year built					X			X				X										
Unit construction					X							X	X	X	X		X				X	
Whole production capacity (tonnes/months)					X		X										X					
Floor system										X					X					X		
Methods of filling and emptying units			X		X		X					X		X			X					
Manure handling					X		X				X						X					X
Pollution prevention measures					X		X															
Ammonium emission prevention measures					X		X					X										
Submit proposals for integrity testing																						X
Proposals to cover existing slurry storage facilities					X															X	X	
Manure from cleaning of storage tanks must be stored over a tight platform with appropriate slope	X																					
Water source		X													X							
Manure quantity					X							X			X		X		X	X		
Slurry: quantity		X			X										X		X		X	X		
Slurry characteristics		X																				
Treatment of slurry		X			X																	
Separation of solid and liquid																X						
Application of slurry		X																				
Disposal of slurry		X																				
For each stream: Method of use, recovery or disposal of each material stream																						X
Slurry storage - covered? Stirred? Is slurry introduced below the surface?																	X			X		

Information required on manure storage	CY L	CY E	DE K	DE L	DE N	DE ST	DK H	DK V	EE	FR	HU	IE	LV	NL -G	PO	PT	SE	SI	SK	UK EW	UK NI	UK SC
Temporary storage		X																				
Land use		X																				
Storage conditions					X				X		X				X							
Manure collection system					X								X									
Distance to residential					X												X					
Storage capacity			X	X	X	X			X		X	X			X		X		X			
Filling equipment					X												X					
Type of tank cover			X	X	X	X											X					
Manure transport											X						X					
Manure recycling											X	X										
Method of mechanical protection											X				X							
Number of animals					X							X			X		X		X			
Water protection measures					X											X			X			
Improvement condition: to provide an impermeable base																				X		
Drainage					X									X	X							
Odour					X									X								
Methods to prevent environmental pollution					X										X							X

Respondents raised few concerns over the information required in permit applications. The table below sets these out. They include issues relating to the performance of the installation, e.g. controlling leaks or preventing pollution. They also include concerns over the ability to assess the impacts of the activities.

Concern	DK - H	PO	SE	UK EW
Prevention of spillage	X			
Leaks		X		
Reduction of ammonia emissions			X	
Reduction of odours			X	
Emissions (ammonia, odour)				X
Assessing the impact of ammonia emissions on sensitive habitats is problematic				X

3.2 Applying for a permit and manure spreading

Question asked:

In the permit application process, what information does the permitting authority require on manure spreading on land? How do operators assess issues relating to manure spreading on land? Are there particular concerns about assessment of manure spreading on land by permitting authorities?

Authorities identified a range of information requested in permitting related to manure spreading on land. These include:

- Whether the receiving land is owned by the operator or another legal entity.
- Information about methods of transport of manure.
- Type and quantity of manure to be spread.
- Information on the receiving land – area, sufficient land available, location, soil quality, nutrient balance, etc.
- Information on cropping on the land.
- Timing of application of manure.
- Losses of nitrogen and phosphorus to air/water.
- Distance of receiving land to residential areas.

However, there can be limitations for some authorities in whether they consider issues of manure spreading. For example, in the **Netherlands**, this issue is not regulated in an environmental permit, but in a national regulation. This regulation is supervised by the 'AID' (General inspectorate). Local government does not see to this part of its regulatory function. Further information on the application requirements in Ireland is given in the Box below.

Information required	CY L	CY E	DE B	DE K	DE L	DE N	DE SC	DE ST	DK H	DK V	HU	FR	IE	LV	PO	PT	RO	SE	SK	UK EW	UK NI	UK SC
Access to arable land (own, tenancy, contract)				X							X							X	X			
Areas to be used for spreading		X										X	X		X	X						
Amount of manure produced						X	X	X					X		X	X		X				
Evidence of planning of spreading: e.g. periodicity, land conditions,														X								
Record-keeping of spreading													X	X	X							
(Maps of) land characteristics: e.g. soil type, erosion risk, soluble P, water bodies (inc wells)															X			X				
Land use and agricultural production															X		X					
Soil conditions and type															X		X					
Fertilisation plan based on crop requirements												X			X			X				
Calculated nutrient balance			X			X	X	X							X			X				
Nutrient management plan, inc. analyses of soil and manure															X					X		
Describe handling of manure and liquid manure						X					X							X	X			
Describe recycling of manure and liquid manure											X											

Information regarding landspreading of manure required in permit applications in Ireland.

The following information is required of farmers in the permit application process:

- Annual production of manure and N and P content.
- Summary table of customer farmers. A coded list must be compiled by the farmers and sent to the Environmental Protection Agency each year. This list can be amended as new customers are identified.
- Map showing location of farms.
- Nutrient management plans for lands demonstrating adequate capacity for recovery of the material produced. This must take account of additional livestock other than bovines owned by the customer.
- Declaration by a suitably qualified person that lands have been inspected and that the pig farm has access to sufficient land to allow for the spreading of the manure.

A key issue with regard to permit applications and manure spreading is how far the IPPC permit can impose conditions on the operator compared to other farmers who receive the manure from the operator. Some Member States require contracts to be established, some set no conditions under IPPC. **Poland**, for example, requires that the operator spreads at least 70% of the slurry on their own land, whereas farmers in some other Member States have little or no land of their own on which to spread the manure.

Respondents raised few concerns over the information required in permit applications relating to manure spreading on land. The table below sets these out. They include issues relating to specific Directives and impacts and legal challenges.

Issue of concern	DK - H	DK - V	IE	PT	SE	UK EW	UK NI
(Limitation of environmental impact)	X						
(Odour)	X						
(Transport)	X						
Sources of knowledge are difficult to access, or not easy to understand		X					
Some European Directives and Danish laws i.e. nitrate Directive		X					
Soil analysis - practicality and cost (esp where large number of farms involved in utilisation of manure from installation)							X
Lack of control in manure spreading - hence the focal point of the permit on manure quantity and areas to be spread				X			

Issue of concern	DK - H	DK - V	IE	PT	SE	UK EW	UK NI
(Phosphorus and nitrogen losses)					X		
Pig farmers argue that they cannot be required to provide information on the use of fertiliser (slurry) as it is controlled under the Nitrates Directive. Legal challenges are pending.			X				
Contingency plans are also needed in case certain land is unavailable for spreading						X	

3.3 Applying for a permit and animal housing

Question asked:

In the permit application process, what information does the permitting authority require on animal housing systems? How do operators assess issues relating to animal housing systems? Are there particular concerns about assessment of animal housing systems by permitting authorities?

Authorities identified a range of information requested in permitting related to animal housing. An example from Poland is provided in the Box below. The range across authorities is detailed in the table below and include:

- Details of the description of the housing itself – placement, size, materials, design, drainage plan, ventilation, insulation, floor type, etc.
- Techniques to remove manure/slurry.
- Transport of manure/slurry.
- Emissions from housing.
- Biogas plant details if fitted.
- Animal numbers, conditions.
- Management of dead animals.

Information concerning animal housing considered in permit applications in Poland

In the permit application process special attention is paid to the following issues:

- The farm buildings must be adjusted to the planned breeding system: number of animals of each production group (sows, weaners, fatteners, etc) determines the required animal housing conditions;
- Number of animals in each pigsty and number of buildings used in production;
- Annual livestock production in tones;
- Maximum annual production capacity of the farm;
- Type of housing (litter, deep litter, fully-slatted floors, solid concrete floor with litter, partly-slatted floors, etc.);
- Detailed description of production cycle (which can be opened or closed) and a cycle span (how long animals are kept on the farm);
- Detailed description of pigsty construction;
- Detailed description of pens and crates location and construction, designed for each type of production group of pigs;
- Information on pens: if pigs are housed in groups or individually;
- Information on feeding systems (construction of appliances for feeding);
- Feeding strategies: description of phase feeding - description of fodder mixtures used in feeding of each production group of pigs (information on diet);

- Information on daily demand for drinking water for animals (water intake per animal);
- Description of ventilation systems used in each pigsty;
- Information on manure removal (types of floor systems used in pigsties, frequency of emptying of manure channels etc.);
- Information on dealing with cadavers;
- Information on technical possibilities for changing a production profile;
- Description of construction materials of pigsties on the farm (roof, walls, floor etc.);
- Description of construction materials of manure tanks on the farm (cover, walls, floor etc.).

Information required	CY L	CZ	DE B	DE K	DE L	DE N	DE SC	DE ST	DK H	DK V	EE	FR	HU	IE	LV	NL F	NL G	PO	RO	SE	SI	SK	UK EW	UK NI	UK SC
Define housing type						X								X		X							X		
<i>Description of housing sheds</i>		X		X		X		X	X	X	X	X	X				X		X			X	X	X	X
Placement						X			X											X					
Size						X			X											X					
Materials						X			X																
Design/type						X			X										X						
Drain plan (water and slurry)									X					X											
Number of sections						X			X																
Number of pigs in each section						X			X										X						
Est. yearly production of each section									X										X						
Ventilation systems						X		X	X					X								X		X	X
Feed /and water system						X		X	X		X			X											X
Area of pigpen						X			X										X						
Percentage with solid and drained floors						X			X										X						
Construction						X													X					X	
Insulation						?																		X	
Temperature																									X
Collection and storage systems (manure, slurry)						X													X		X				X
Heating						X														X		X			
Floor type						X				X															
<i>Techniques used to remove manure from floor</i>											X														
Production flow									X																
Compliance with BAT										X			X	X	X					X				X	X
Slurry management details																								X	
Frequent removal of waste by vacuum pump	X																								
Manure flushing																	X	X							
Manure handling system						X													X		X				
Frequency of transport of																				X					

Information required	CY L	CZ	DE B	DE K	DE L	DE N	DE SC	DE ST	DK H	DK V	EE	FR	HU	IE	LV	NL F	NL G	PO	RO	SE	SI	SK	UK EW	U K N I	UK SC
manure to storage tank																									
Recharge of heat from housing system																				X					
At least 26 weeks storage capacity (see manure storage)														X											
Sanitary veterinary permit																				X					
Feeding techniques and drinking water management						X														X					
Expected emissions (ammonia, odour)			X	X		X						X													
How deal with waste, cadavers and manure						X																			
Composition (nutrients) of feed						X																			
Emergency plan						X																			
How to protect against fire						X																			
For biogas plant quantity and type of input material are required					X	X																			
Animal welfare standards				X		X																			
System of animal breeding																			X						
Number of pigs						X													X		X		X		
Veterinary conditions										X															
Holding dead animals											X								X		X				

Authorities raised some concerns in relation to information required in permitting relating to housing systems. These include:

- It is difficult for permitting authorities to determine what is BAT (**Estonia**).
- Access to, and understanding of information, is a problem (**Denmark**, Vejle Kommune).
- Potential changes (e.g. cost) required to meet BAT and the associated timescales can be a problem (**UK**, Northern Ireland).
- Many farms have a range of housing systems on their farm. Many use straw-based solid floor systems - the acceptability of which is not covered in detail in the BREF (**UK**, England and Wales).
- In Scotland the standard system is for deep slurry storage under slats. Operators argue that alternatives given in the BREF are expensive, not workable and would be difficult to establish as the building supply industry is not set up to use these (**UK**, Scotland).

3.4 Applying for a permit and air abatement techniques

Question asked:

In the permit application process, what information does the permitting authority require on air abatement techniques? How do operators assess issues relating to air abatement techniques? Are there particular concerns about assessment of air abatement techniques by permitting authorities?

Some respondents (**Portugal, Slovakia**) state that, as air abatement techniques are not required, information is not requested in the permit application process. The requirements for applications in other authorities are set out in the table below. In many cases they state that use of such techniques is theoretical, but have provided an indication of what would be required in such cases. The responses also reflect the understanding of ‘techniques’, which in some cases is interpreted as ‘technology’. While use of abatement technology may be rare, techniques in the broader sense are certainly widely used and expected.

The types of information that are requested can be categorised as follows:

- Information on the operation of the installation.
- Information on pollutants emitted.
- Behaviour of pollutants in the environment and effects of these, e.g. in relation to statutory obligations.
- Techniques to be applied, including management, housing and waste handling and, where necessary technical air abatement equipment.
- Evidence of certification and maintenance schedules of equipment used.

The most common reason for the lack of air pollution abatement technology is the cost to the operators (e.g. **Denmark, Ireland**). The **UK** (England and Wales) also notes that the BREF provides little information on this issue and attempts to model specific emissions for sensitive receptors have proved to be very difficult, thus creating problems in defining what controls are needed. **France** also notes that it is difficult to provide accurate estimations of emissions from different types of housing.

Member State/ authority	Information and assessment relating to air abatement techniques
CY	Permit application form asks for a description of methods for air pollutant abatement and a summary of proposed control programme.
CZ	Applicants must specify how they meet emissions limits for housing, storage capacities, boiler house and other activities and a specific demonstration of applying BAT to tackle ammonia emissions.
DE – B	If pollutants are a problem, air control technology may be required. Evidence of performance, certification and meeting statutory obligations.
DE - K	Information on volume flow and mass flow and ventilation rates. Technology must be certified and meet requirements of TA Luft, etc.
DE – N	Air abatement techniques are not required yet as BAT in pig farming. So only if the applicant has air pollution problems is it necessary to use them. In such cases the applicant should describe how it works, including certification, and how much pollution will be reduced. The applicant also has to provide information on maintenance, operating control and management of the air abatement techniques, which materials are used and how often these have to be changed, etc.. Currently, there exists no guideline about the information needed in the application and how to assess this.
DE – SC	If there are critical locations, the use of exhaust air cleaning technology is required and operators must demonstrate certification and maintenance.
DE – ST	Description of the exhaust cleaning technology, and information on performance and certification for odour, ammonia and dust.
DK- H	If a site does not meet the required levels of odour or ammonium emission and the operator wishes to reduce this with a certain technology, applicants should identify the precise nature of the technology and its effect on emissions.
DK – V	Only required if there is a relevant Danish BAT data sheet for a possible housing system or if odour calculations show that limits cannot be met without use of air abatement techniques.
EE	Operators must demonstrate how they will reduce emissions, in particular for manure stores, and how to ensure the local environment is protected. The permitting authorities find it difficult to assess BAT.
FR	Techniques relating to reduction of ammonia.
HU	If air pollution is a problem, the same requirements apply to pig units as to other IPPC installations. In such cases the following information is required: <ul style="list-style-type: none"> • Detailed description of installations and activities • Description of environmental impact, including pollutant dispersion • Description of the typical uses of air (ventilation, aspiration, changes in the dimension and period of air demand of the technology and the

	<p>energy generation)</p> <ul style="list-style-type: none"> • Description of equipment and technologies for supplying clean air from the air aspirated from the environment • Detailed description of the technologies causing air pollution, parameters and factors influencing pollution • Description of equipment for cleaning waste gases and their efficiency, and description of the management and disposal of residues from the waste gas treatment equipment • Description of the parameters of the stationary point and diffuse air polluting sources, the waste gases emitted, the air polluting components (including odour), comparison of the permitted and actual emissions • Description of the typical emission data of mobile air polluting sources, operated temporarily or regularly in connection with the activity, impacts of transport carried out in connection with the activity • Description of the internal orders and measures concerning air pollution control (if the installation has an action plan, a description of that plan and its implementation)
IE	Air abatement techniques have not been proposed by applicants, but they may identify mitigation measures to reduce or minimise impacts, i.e. reduce agitation of slurry, restrict slurry removal to week days etc.
LV	Permit application requests modelling of air quality and air emission limits.
NL – F	Description of system used and efficiency of reducing pollution.
NL - G	<p>Drawings of the abatement techniques taking account of leaflets which describe control measures. Control and maintenance are a secondary activity for the farmer.</p> <p>Questions arise with what to do with waste products, what does the farmer when the technique fails or is out of order and how does he communicates this?</p>
PL	<p>According to national regulations the permissible emission of gases from a pig farming installation to air should be fixed. However, the regulation relates only to emission from point sources such as ventilation system (excluding a gravity ventilation system). There is no obligation to define the acceptable emission level for both fugitive emission and emission from a gravity ventilation system. The operator is obliged to implement BAT, including techniques to reduce emission to the air from the pigsty, manure storage and in the process of manure spreading. The information on adopted solutions should be included in the submitted application.</p> <p>The calculations of the spread range of emitted pollutants must be carried out according to guidelines included in the Decree of the Ministry of Environment of 5 December 2002 <i>on reference levels for certain substances in the air</i>. Information on both the results of analysis of contaminations emitted to the air and the range of emission must be submitted with the IPPC application.</p> <p>An applicant is obliged to submit detailed information on factors which can influence on the emission to the air. An applicant submits the results of calculations of annual ammonia emission level for pigsties operating on the farm. Additionally, in the application there is also information on the emission level from additional units such as a boiler house. in the application proposed methods of air abatements should be listed, such as:</p>

	<ul style="list-style-type: none"> • use of non-bedding system, • minimization of nitrogen losses by increase in effectiveness of protein use from fodder, • adjustment of protein contents in fodder to animal needs, • use of phase feeding, • breeding of animal with genetic predisposition to better feed conversion, • addition of growth promoters to the fodder, • having the slurry tanks with the capacity enough to store manure by the period of at least 6 months, • spreading to land taking into account weather conditions and wind direction, • avoidance of manure spreading to land at weekends and holidays, • mixing manure with soil in the period of few hours and not later than 24 hours after application.
RO	Information required includes: type of ventilation, number and type of ventilators, energy consumption; the sources of air pollutants and type of pollutants; type of food and nutritional management; and collection, transfer, treatment, storage and disposal of waste.
UK- EW	The applicant is required to establish the emissions from housing, manure and slurry storage and landspreading, using standard ammonia emission factors for different housing and storage systems. To calculate external effects of ammonia and dust emissions, they submit an environmental risk assessment (following published guidance). Applicants have to state which techniques they are to use to meet the management practices considered to be BAT for controlling air pollutants set out in the published sector guidance.
UK- NI	The applicant is required to establish the emissions from housing, manure and slurry storage and landspreading, using standard ammonia emission factors for different housing and storage systems. On most existing sites good management is the primary abatement technique used.
UK- SC	Depending on the details of the installation, methods for controlling emissions (if any are used) will be asked for. On most existing sites good management is the primary abatement technique used.

3.5 Applying for a permit and odour

Question asked:
In the permit application process, what information does the permitting authority require on odour? How do operators assess issues relating to odour? Are there particular concerns about assessment of odour by permitting authorities?

Competent authorities generally require operators to address odour issues in the permit applications. Overall, the main issues that need to be addressed are:

- Identifying specific sources of odour (e.g. housing, land-spreading, water treatment, etc).
- Identify how changes to those activities (e.g. through manure management) can affect odour emissions.
- Identifying whether there are neighbours for which odour would be a nuisance (and calculating this).
- Identify how odour emissions, etc., comply with BAT and/or regulations.
- Identifying measures to reduce odour where this is a problem.

Details of the requirements identified in the different Member States are set out in the table below. The level of detail required on the main issues can vary. Some operators might be asked to use standard estimates of odour (e.g. per animal) and standard distances to neighbours. In other cases more detailed calculations based on weather patterns might be required. Some authorities have indicated that research on these issues is ongoing. Particular problems can arise with existing installations which are sited too close to housing and where control measures are difficult. Some authorities have also highlighted methodological difficulties in demonstrating a link between individual odour events and specific farm activities.

While the identification of measures to reduce odour can be specific to individual aspects of the installation, some Member States require the development of an odour management plan, particularly if there are complaints. This requires the operator to consider all aspects of the operation of the installation. An example of the detailed requirements in a permit application are given for **UK** (Scotland) in the box below, which states the need for such a plan in the case of complaints.

Member State/ authority	Information and assessment relating to odour
CY	Operators must find all suspect sources of odour and take all the appropriate measures in order to eliminate the odour.
CZ	Operators must show they meet safe distances from residences set in the Building Law 183/2006 Col. A Government Decree on the concentration of odour and nuisance is under preparation.
DE – B	Odour forecasts are usually required using the AUSTAL model and standard emission factors.
DE - K	Information is required on volume flow and mass flow rates, ventilation rates, emissions and concentrations (based on TA Luft).
DE - L	Information is required on abatement measures and the effect of odour reduction. Emissions must be estimated and concentrations determined using the AUSTAL model using certified weather data. Olfactory measurements must be undertaken using EU standards.
DE – N	For IPPC pig farms above about 5,500 fatteners or about 1,750 sows or about 24,000 piglets the applicant has to predict odour concentrations using the model in TA Luft. However, there is no current standard for estimating emissions from animals. For farms with fewer animals it is only necessary to

	check distances to habitation, etc.
DE – SC	If odour is a problem, assessment is required using projections according to standard requirements.
DE – ST	Odour projections are required according to standard requirements.
DK- H	Odour emissions are calculated by authorities from the information on production and housing. If a site does not meet requirements of maximum concentration at the location of neighbours, the operator will normally try to find an alternative site for production.
DK – V	Odour calculations are based on the number of animals and number of places for housing animals.
EE	Operator to describe how to improve air quality, understand the effects of weather on dispersion and techniques to use (e.g. land-spreading of manure).
FR	Information on distance between the pig housing and residential housing and the average wind direction and force, noting that in some places (e.g. Brittany) residents are more used to odour. An assessment of efficiency of anti-odour products has been launched by the Environmental Department.
HU	The Hungarian BAT guidance note states that ‘As part of the application the operator should: <ul style="list-style-type: none"> • supply the general requirements for odour control; and in addition, where odour could potentially be a problem, the operator should categorise the emissions as follows: <ul style="list-style-type: none"> • high level emission which is expected to be acknowledged in the Permit – i.e. there will be an allowed emission from the process and an element of BAT is adequate dispersion between source and receptor to prevent odour nuisance. The emission will be allowed under the permit but it is acknowledged that, under certain conditions, the plume may ground causing odour problems. Conditions in permits are likely to be based on the actions to take when such events occur. • emission should be preventable – i.e. emissions can normally be contained within the site boundary by using BAT such as containment, good practice or odour abatement. • emission is not preventable under all circumstances e.g. from a landfill or uncovered effluent treatment plant but potential problems are controlled by a programme of good practice measures; • for each relevant category, demonstrate that there will not be an odour problem from the emissions under normal conditions; • for each relevant category, identify the actions to be taken in the event of abnormal events or conditions which might lead to odour, or potential odour problems. • describe the current or proposed position with regard to any techniques given below.’ [references to BAT for different floor types and odour control on and off site]
IE	Applicants are mainly existing installations, so the authority is satisfied to identify they have no complaints by neighbours. Where complaints have been recorded they may identify mitigation measures. The Environmental Protection Agency commissioned research to identify emission factors (odour) and also calculate the extent odour nuisance contours that may extend outside a pig unit.

	Operators are required to prepare and maintain an odour reduction programme on an annual basis, where odour is identified as a potential nuisance, covering emissions such as from slurry storage, feeding, covered slurry storage etc. and long term upgrading of housing.
LV	The operator has to demonstrate compliance with requirements of national legal acts on odour. Usually modelling of odour is submitted with a list of measures to prevent and reduce odour.
NL – F	Operator makes a calculation of what can be permitted within the housing and/or abatement system.
NL – G	Ensure that all parameters that are used in the odour calculation are known and unequivocal. The authority asks for measures to be taken to reduce diffuse emissions. When there are complaints, the farmer or the government must know the dose-effect relationship. At the ‘Knorhof’ (an extremely huge pig farmer) the Province made a reconstruction of historic odour issues to ensure compliance with acceptable odour levels. Overall, particular care is taken with regard to diffuse emissions such as wet feeding installations and the storage of wet food
PL	Information on odour emission itself is not required by permitting authorities as there is no special procedure in IPPC permitting which relates directly to assessment and abatement of odour emission (although an Act on odour nuisances is under preparation). However, sulphur dioxide and ammonia are considered as compounds responsible for odour emission. Emission of both compounds from a pig farm is limited and strictly defined in the IPPC permit. Operators should assess the range of emissions to the air and address air abatement (see above).
RO	Issues considered include: framing an Area Plan with neighbours; sources of odour; type of food and nutritional management; management of waste water, water treatment and collection, transfer, treatment, storage and disposal of waste.
SE	Issues considered include: distance to neighbours; type of vegetation and topography between the farm and the neighbours; dominant wind direction; and technique for manure spreading and buffer zones to neighbours. Neighbours are invited to take part and give opinions several times during the permitting process. The distance between pig farms and residential houses and public buildings is the crucial factor to get an acceptable odour situation.
UK- EW	The applicant is required to produce an odour management plan if there has been either a substantiated odour complaint, there is a sensitive receptor such as housing within 400 metres of the installation boundary, or if the Local Authority (consulted by the competent authority on IPPC permit applications) has identified that odour is an issue. Guidance on producing an odour management plan includes advice on preventing the generation of odour, abatement/treatment techniques and promoting good practice to control odours by maintenance, cleaning, containment etc. It also covers the reaction to incidents and complaints. Odour issues can be very controversial. Substantiating complaints which may relate to transitory and irregular events can prove difficult in isolating the exact cause in rural areas, and therefore identifying the most appropriate remediation option.
UK- NI	Where there are dwellings within 400m of the installation or there have been odour complaints, operators are required to submit an odour management plan.

	For new installations the operator is required to demonstrate that the impacts from odour will be acceptable on any local dwellings (i.e. levels less than a guideline value of 3OU/m ³). Where there are close dwellings air dispersion modelling may be needed using odour emission factors for different types of pigs/pig housing. In general for pig installations (particularly large farms), air dispersion modelling suggests that separation distances from dwellings need to be quite large.
UK- SC	<p>The approach to odour has been to apply BAT through the use of an odour management plan produced by the operator and reviewed should there be an issue with odour from the site. The permit also has a “catch all” condition prohibiting the release of any offensive odour from the site. Details of what operators are required to submit in permit applications in relation to odour are given in the Box below.</p> <p>This seems to deal with most situations. However, a problem arises where an operator is operating to best practice, but is still causing a problem. The next step (once slurry handling issues have been addressed) is to consider the application of abatement to odour from the housing by extracting air and treating it. However, the industry has resisted this due to the cost and, therefore, is not considered to be BAT.</p>

Scotland: Text from the permit application form relating to odour

Measures for controlling odour – Have you or the local authority received odour complaints relating to your installation within the last 5 years?

No	
Yes	

If “yes” please provide an odour management plan describing the measures you will take to manage odour from the installation. The plan should

- Describe the main sources of odour (including infrequent sources);
- Identify the nearest sensitive locations
- Detail the proposed techniques and measures for control of odour from the installation.

<i>Doc Reference</i>	
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GUIDANCE

Requirements to control odour will be site-specific, depending on the location of the installation. Guidance on the production of an odour management plan can be found in Appendix 4 of the Standard Farming Installation Rules. You should use the guidance to produce a odour management plan. Your permit will require you to implement your odour management plan

Odour - Section 2.8 of SEPA’s standard farming installation rules deals with the issue of odour emissions from your installation. Having read this part of the document including the guidance on how to meet the rules do you propose operating your installation in such a way as to ensure full compliance with this section?

No	
Yes	

If you have ticked “No” please tell us the following:

- Which rules you will need time to comply with and why.
- Where you propose upgrading your activities to ensure compliance with the rules please provide a detailed proposal and timescale.
- Which specific aspects of the rules you will never be able to comply with and why.
- Where you are unable to comply with a rule (either permanently or until your planned upgrade takes place) detail what alternative techniques you will use to ensure you are using the best techniques available to you to ensure protection of the environment.

Please deal with each ‘Rule’ separately.

3.6 Other issues

Question asked: <i>Are there any other concerns about or issues raised in the permit application process?</i>
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Competent authorities raised the following additional issues/concerns in relation to the permit application process:

- **Denmark** (Vejle Kommune), **Germany** (Neubrandenburg): Methods and models used to assess issues, particularly ammonia.
- **Germany** (Brandenburg, Neubrandenburg, Schwerin, Stralsund), **UK** (England and Wales, Northern Ireland): Difficulties in the assessment of potential ammonia impacts on local sensitive habitats – ammonia emission factors to be used; methods for assessing the impacts on the habitat(s), etc.
- **Portugal**: There are concerns relating to manure treatment in lagoons. It is common practice to separate the solids to spread on agriculture land and the liquids to treat in aerobic lagoons which can evaporate a great deal in the warm and dry climate. The major concerns are related to cases of discharge of wastewaters to rivers as permitted emission levels are high.
- **France**: In Brittany there is concern over the links between animal farming, agronomy and environment, especially for water quality (phosphorus and nitrogen). For example, there is no reliable control method which would guarantee the right balance of fertilization.
- **France**: There is also some difficulty to coordinate the application of some provisions, whose effects are opposite, such as provisions regarding manure treatment (which needs much energy) and measures to limit energy consumption.
- **Sweden**: Cooling systems for manure and recovery of energy.
- **Sweden**: Feed: the P-content of the feed and a feeding plan correlated to age of the pig as well as overall feed efficiency of nitrogen and phosphorus.
- **Netherlands** (Gelderland): During producing wet food with potato starch sometimes yeasting can start, although this is no longer an activity requested by farmers.

- **Ireland:** Testing of the quality of slurry storage facilities is problematic, mainly due to the difficulty of examining and test underground tanks.
- **Ireland:** The replacement/upgrading of housing and storage is very slow due to the long life-span of such facilities, i.e. 20 years.
- **UK (Scotland):** Defining the scope of IPPC has been difficult. Understanding what the “installation” means in the context of the intensive agriculture industry has been difficult due to the geographic distribution of housing. In addition defining what a “place” is and what the “capacity” of an installation might be have also been problematic.
- **UK (Scotland):** The costs of application are a major concern for the industry.
- **Germany (Neubrandenburg):** The expertise necessary for noise assessment is a challenge.
- **Germany (Neubrandenburg):** The expertise necessary for measuring compensation for habitat damage is a challenge.
- **Poland:** Stakeholder consultations are important and non-governmental organisations usually take part in the process, lodging objections, entering protests or proposing amendments to the permit applications. These opinions directly influence the IPPC permitting process.
- **Estonia:** Accidents and how these depend on weather conditions.

4. SETTING PERMIT CONDITIONS

4.1 Setting permit conditions and manure storage

Question asked:
*What types of conditions have been established in permits relating to manure storage?
 Are there any problems/issues concerning the setting of permit conditions on this issue?*

Authorities identified a wide range of conditions that can be set out in permits in relation to manure storage. These are identified in the table below, with a specific example from Ireland in the Box, and include:

- Requirements concern storage capacity, including different specific months of manure production, monitoring of overflow, monitoring of manure levels.
- Materials for storage facilities, including materials, protection against corrosion.
- Covering of storage facilities, including type, specific conditions.
- Location, including avoidance of being near residential areas.
- Prevention of leakage and protection of water resources.
- Specific conditions for coverage of lagoons.
- Monitoring requirements for the above issues.

Example of permit conditions relating to manure storage in Ireland

- The licensee shall have in storage an adequate supply of containment booms and/or suitable absorbent material to contain and absorb any spillage at the installation. Once used, the absorbent material shall be disposed of/ recovered at an appropriate facility.
- The washwater storage tanks shall be fitted with high-level indicators within twelve months of the date of grant of this license.
- The licensee shall provide a minimum of 26 weeks storage of manure onsite or at an agreed storage location unless the licensee has a contract for the transfer of manure to a person authorised or exempted under and in accordance with the Waste Management Acts 1996 to 2008 or the Environmental Protection Agency Acts 1992 and 2007 to undertake their collection and recovery of the manure.

Conditions	CY E	CZ	DE K	DE L	DE N	DE SC	DE ST	DK H	DK V	EE	FR	HU	IE	LV	PO	PT	RO	SE	SI	SK	UK EW	UK NI	UK SC
Capacity																							
Storage capacity of at least 6 months of production	X	X	X	X	X	X	X	X	X			X	X		X								
Storage capacity at least 4 months		X																		X			
Storage capacity			X	X	X	X	X		X	X	X				X			GBR (10 months)					X
Storage capacity enough to comply with rules on the spreading and use of nutrients (4-9 months)																			X				
Units must withstand mechanical, thermal and chemical impact								X															
Floor of storage units must be sealed to prevent emissions	X							X								X					X		
Slurry must only be stirred before emptying unit and field application								X															
Must be monitored for overflow																				X			
Maximum level must be marked on open underground storage and must not be exceeded																				X			
Material																							
Concrete or steel tanks																	X		X				
Must be protected against corrosion								X				X					X		X				
Very specific requirements of individual materials												X											
Cover																							
All units must have a solid lid								X								X							
Coverage of manure	X		X	X	X	X	X		X			X											
Type of coverage			X	X	X	X	X											X					
All new slurry storage facilities must be covered					?					X											X	X	
Proposals to be submitted for existing uncovered stores																					X	X	
Proposals for upgrades to meet SFIR																							X
Location																							
Must not be near residential areas	X								X						X			X					
Determination of when manure is composted									X														
Water																							
Storage must be water resistant /sealed to			X	X	X	X	X				X	X			X	X			X	X			

Conditions	CY E	CZ	DE K	DE L	DE N	DE SC	DE ST	DK H	DK V	EE	FR	HU	IE	LV	PO	PT	RO	SE	SI	SK	UK EW	UK NI	UK SC
prevent leaching																							
Must be specified distance from water	X		X	X	X	X	X																
No manure storage can be on water protection areas			X	X	X	X	X					X											
In areas of protected water, storage units must have emergency storage																				X			
Lagoons																							
Slurry lagoons must be sealed	X															X							
Slurry lagoons must have a lid/cover					X	X	X									X							
Slurry lagoons must comply with the safety height (40cm below surface)	X																						
Provide sufficient technical management														X									
Visual checking of constructions					X									X					X				
Manure storage covering														X									
Avoid leaking					X									X						X			
Provide sufficient process management														X									
Drainage					X									X									
Storage														X									
Checks																							
Regular maintenance and record keeping															X								
Keep records on supplement of covering later														X									
Keep records on manure dispersal														X						X			
New units required to have a simple leak detection facility below tank					X							X	X										
Emptied regularly for inspection and maintenance					X												X						
Regular monitoring of tightness of seal			X																				
Once a year units must be cleaned, checked for leaks and repaired										X													
The seal of liquid manure stores must be checked every 10 years and the result presented to the authority																					X		
Must comply with SFIR																							X
Construction standards																			X				X

Problems identified by authorities with regard to setting permit conditions for manure storage include:

- There are problems defining permit conditions based solely on BAT techniques set out by BREFs as BREFs do not have legal status - therefore difficult to enforce requirements that are described only in the BREF (**Hungary**).
- The BREF itself is hard to use, although this is not a particular problem due to the level of guidance available at the national level (**Netherlands**, Gelderland).
- Practicality / cost of covering existing storage (**UK**, Northern Ireland).
- Minimum distances between farms (storage facilities) and dwellings are not prescribed in national legislation (**Slovenia**).
- Difficult to ensure existing slurry lagoons comply with specifications (**Cyprus**, MANRE).
- There is a tension between methods used for reducing ammonia within units and quality of manure for spreading (**France**).
- Testing is difficult - methods are not very accurate or practical e.g. tanks may be shallow or inaccessible (**Ireland**).
- It is difficult to get operators to make improvements (repair or replace) storage facilities other than as part of natural replacement (**Ireland**).
- Infrastructural changes are expensive; there is a lack of willingness to comply amongst farmers due to poor financial returns (**UK**, England and Wales).
- Often the weather conditions are a problem (**Estonia**).

4.2 Setting permit conditions and manure spreading

Question asked:
What types of conditions have been established in permits relating to manure spreading on land? Are there any problems/issues concerning the setting of permit conditions on this issue?

Authorities identified a wide range of conditions that can be set out in permits in relation to manure spreading on land. These are identified in the table below with specific examples from Hungary, Ireland and Poland in the following Boxes. They include:

- Details on the land to which manure is to be applied.
- Timing of application – avoiding specific times of year or soil that is frozen or saturated.
- Restrictions with regard to slope of ground.
- Need to conduct nutrient balances for application.
- Undertaking analysis of manures and soils.
- Meeting requirements of a nutrient management plan.
- Avoiding application close to sensitive areas, such as water courses, including use of specific buffer zones, etc.

- Conditions for incorporation into soil – ploughing, injection, etc.
- Equipment should meet technical specifications and be maintained.
- Informing local authorities when spreading is to occur.
- Recording and monitoring obligations concerning the above conditions.

Conditions	CY E	CZ	DE L	DE N	DE SC	DE ST	DK H	DK V	EE	FR	HU	IE	LV	PO	PT	RO	SE	SI	SK	UK EW	UK NI
Timing/method										X											
Manure must only be applied on established crops, or just before crop planted							X														
Manure can only be applied 1 Feb - 1 Oct.							X														
From 1 Sep - 1 Oct, manure can only be applied in fields with a winter-crop							X														
Forbidden to apply manure 15 November - 1 April with some exception. Application of manure containing easily soluble N after harvesting is forbidden, if no sowing in autumn.											X										
There are time limits on spreading			GBR	GBR	GBR	GBR			X				X	X		X	GBR	X			
Restrictions concerning weather conditions														X			GBR	X			
Restriction on spreading on land frozen or snow-covered			GBR	GBR	GBR	GBR					X		X			X	GBR	X	X	X	
Restriction on spreading on land saturated or flooded			GBR	GBR	GBR	GBR										X		X		X	
Restriction on spreading on steep slopes			GBR	GBR	GBR	GBR													X		
Application of liquid manure forbidden on steeper slopes than 6%, except with "pipe curtain" technology - allowed up to 12% steepness. Injection technologies can be applied up to 17% steepness.											X										
Special regulations for the application of liquid manure on steeper slopes than 10%			GBR	GBR	GBR	GBR															
No manure spreading on winter cereal 1 Aug - 15 Feb																	X				
No manure spreading on grassland 20 Oct - 15 Feb																	X				
No manure spreading in winter 1 Nov - 31 Jan			GBR	GBR	GBR	GBR															
Avoid spreading at weekends and public holidays														X			X				
In sensitive areas direct mulching or ploughing in must take place within one hour																	X				
In winter, the application of slurry is prohibited for 4 months																					
Spread slurry must be incorporated into the soil within 24 hours		X												X							
Incorporation of manure with the soil must take place 12 hours after the spreading	X																X				
Slurry must be ploughed in as soon as possible, within 4 hrs									X								X				
There must be rapid incorporation into soil			GBR	GBR	GBR	GBR												X		X	
Liquid manure can only be used on land during "agricultural time"																			X		

Conditions	CY E	CZ	DE L	DE N	DE SC	DE ST	DK H	DK V	EE	FR	HU	IE	LV	PO	PT	RO	SE	SI	SK	UK EW	UK NI
Requirements on even spreading and techniques for injection			GBR	GBR	GBR	GBR				X											
Transport																					
Maintain records of manure movements												X									X
Area																					
If applied in vulnerable area (high risk of nutrient leaching) either: the amount applied must be reduced; or catch crop must be established; or crop rotation system must be established to reduce leaching							X														
Manure/ slurry can be spread to land only when soil is capable of accepting it, and on suitable areas			GBR	GBR	GBR	GBR													X		
Spreading must take place away from sensitive areas	X																X	X			
When spreading takes place in a vulnerable zone, application must comply with the nitrates Directive action programme	X																	X			
There must be sufficient land area available			X	X								X	X		X		X				
Additional provisions for applying manure to land in Nitrate Vulnerable Zones								X								X					
Water																					
Nutrients from fertilization shall not enter surface waters, so application is forbidden in a 2 m band from watercourse, 20 m from lakes, 25 m from springs, or wells used for watering animals or for humans											X										
Limits on P and N washout to surface water and groundwater								X													
Before spreading, groundwater must be monitored for total N & COD demand													X								
Run-off to water must be avoided													X			X					
Must be buffer zones near water bodies and private wells																	X	X			
Manure must not be applied adjacent to any water course																X		X	X		
BAT concerning water protection														X							
Application is forbidden in a 3 m distance from from running or standing water (special regulations for slopes ?)			GBR	GBR	GBR	GBR															
Nutrients																					
Nutrient balance demonstrated				X						X	X	X		X							

Conditions	CY E	CZ	DE L	DE N	DE SC	DE ST	DK H	DK V	EE	FR	HU	IE	LV	PO	PT	RO	SE	SI	SK	UK EW	UK NI
Demonstrate that manure is applied in accordance with the nutrient management plan																	X	X			X
Limit of 120 kg N/ha											X										
Review of soil nutrient analysis, especially P																	X				X
Obligatory manure application plan must be based on soil analyses																		X			
Yearly input of P, K and N should not exceed levels outlined in national law, based on Nitrates Directive																		X			
There are limit values for the input of dangerous substances and fertilisers																		X			
Type of soil	X																				
Before spreading, soil must be tested for nutrient content, including P and N				GBR																	
Before spreading, a nutrient management plan must be prepared												X					X			X	
BAT concerning soil protection														X							
Every year the farmer must analyse content of P and N in manure before spreading																			X		
General																					
Notification of changes to plans																					X
Manure application plan must determine total amount of manure, time of spreading and locations																	X	X	X		
Equipment used for spreading must be in accordance with the proper technical standards				GBR														X			
Spreading must comply with the good agricultural code	X			GBR														X			
A manure management plan must be implemented and reviewed every 4 years																				X	
There must be agreement with local municipalities on the time/date of manure spreading													X								
Appropriate spreading techniques must be used													X					X		X	
Records must be kept on manure spreading													X				X	X	X		
Attention must be paid to wind direction, for residential areas						X										X	X	X			
The farmer obliged to communicate to the authorities of nearby villages that spreading is to take place																			X		
Train farm staff to understand responsibilities														X							

Examples for conditions set in permits in Hungary regarding manure spreading on land

- When landspreading, the direction and speed of the wind and the temperature shall be taken into account, especially on areas close to inhabited areas. Cultivation of the livestock manure into the soil shall be done in 48 hours after landspreading.
- Provision should be made for the liquid manure to be landspread on arable land.
- Provision should be made so that for the landspreading of liquid manure a permit would be obtained from the soil protection authority.
- The small amount of livestock manure from animal husbandry and the solid manure from the phase separator equipment shall be used on arable land, shall be disposed of without causing environmental harm.
- Livestock manure is applied on land typically during August-November. In spring livestock manure can only be applied on sandy soils. Livestock manure has to be applied mostly under plants requiring livestock manure (sugar beets, corn, annual feedstock crops, rape). Livestock manure shall be cultivated into the upper, structured layer of the soil at once, if possible, but in no case later than in 48 hours.
- The landspreading of manure shall be scheduled in a way that the storage vessel would be emptied before winter.
- Provision should be made for careful landspreading on drained areas, as the risk of leaching is higher.
- Manure disposal shall be carried out in a way that ensures that the smallest possible surface of the manure gets in contact with air.
- Provision should be made so that the liquid manure is used in agriculture.
- At landspreading the air shall not be loaded to an extent that constitutes air pollution or causes odour nuisances. In order to ensure this:
 - manure shall be transported to the land by a leakproof vehicle
 - landpreading shall be carried out against the direction of the wind in the vicinity of odour sensitive areas.
 - landpreading shall be carried out in dry, windy weather if possible, in early morning, except Sundays and public holidays.
- Provision should be made for the continuous collection and recycling of the manure originated on the site, in a way that avoids the pollution of the environment.
- For the landspreading of liquid manure a permit shall be obtained from the soil protection authority, for the amount originated at the site. The documentation prepared for the permit application shall contain a soil protection expert report, a detailed description of the transport routes, taking into account mostly roads avoiding the inner areas of settlements.
- Odorous and gaseous emissions from landspreading shall be avoided by using the appropriate techniques.
- Also for the landspreading of liquid manure an annual manure landspreading plan shall be prepared, and a register shall be made on the discharged amounts. The landspreading shall be done by injecting. The landspreading of the manure shall be

done on the lands available according to the documentation.

- Transport of waste water and liquid manure is not allowed at the same time by the same vehicle. Mixing of waste water and liquid manure is not allowed in the tank of the vehicle. Transport of livestock manure has to be done by a closed vehicle, or a vehicle covered by a tarpaulin, in the early morning. The transport has to be done as quickly as possible. Any leaks shall be avoided during transport. All the transports have to be registered. The documents of transport have to be collected so as to these can be presented at the time of inspection.

Standard permit conditions in Ireland for landspreading of manure

Slurry/manure shall only be recovered by landspreading subject to the following conditions and the prior agreement of the Agency:

- The licensee shall submit by the first of January annually and maintain on-site the following:
 - Annual production of slurry/manure and the nitrogen and phosphorus content of the slurry/manure;
 - Summary table of customer farmers receiving slurry/manure. The table shall include as a minimum 'Customer Code' (Name to be maintained on-site), 'Townlands' and 'Quantity of Slurry/manure (m³)'. The Table shall be updated based on a nutrient management plan, as required to include additional lands acquired during the year;
 - Map (scale of 1:50,000) showing the location of farms where slurry/manure may be recovered;
 - Declaration by suitable qualified person that lands, for recovery of slurry/manure, have been inspected and are suitable for landspreading, and
 - A nutrient management plan for all lands demonstrating adequate capacity for recovery of slurry/manure generated at the installation. Nutrient management plans shall be to the satisfaction of the Agency and shall be agreed prior to the movement of slurry/manure off-site. Nutrient management plans may, until 1 January 2011, be based on the 'Nitrogen and Phosphorus' Statements issued by the Department of Agriculture, Fisheries and Food. Nutrient management plans shall be maintained on-site for inspection by authorised persons.
- The licensee shall maintain on-site for inspection by authorised persons maps (scale 1:10,560) showing land that may be used for recovery of slurry/manure.
- The licensee shall ensure, in all cases where there is a transfer of slurry/manure from the installation to storage provided on farms in the client list, that the recipient farmer is advised of the need to store the slurry/manure in a purpose-built holding structure adequate for the protection of groundwater and surface water.
- Soil monitoring shall be undertaken as outlined in *Schedule C.6 Ambient Monitoring, Land Used for Landspreading* and a summary report included as part of the Nutrient Management Plan.
- Landspreading shall, as a minimum, be carried out in accordance with S.I. No.

378 of 2006 European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2006. All landspreading activities shall be carried out in such a manner as to avoid contamination of surface waters and groundwaters, and so as to minimise odour nuisance.

- Landspreading shall be undertaken only in accordance with appropriate national standards and protocols as agreed by the Agency.
- Landspreading from this activity shall take place only on lands agreed in advance in writing by the Agency. Alterations to this landbank are subject to prior written agreement with the Agency.
- Landspreading shall be undertaken to ensure an even spread of slurry/manure over land. Manure (excluding washwater/slurry) shall be spread by rotary spreader or similar machine. Washwater/slurry shall be spread using soil injection, bandspreading or low trajectory splashplate methods. Any other method must be agreed in advance by the Agency.
- Slurry/manure shall be considered to be a manure or fertilizer when recovered as defined in the Waste Management Acts 1996 to 2008 and as agreed by the Agency.
- The licensee shall maintain a 'slurry/manure register', to the satisfaction of the Agency, showing, as a minimum, details in accordance with Article 23 of S.I No. 378 of 2006 European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2006.

Conditions concerning manure spreading applied in Poland

In Poland operators must meet the requirements set out in GBRs (general binding rules). Overall, there is a significant amount of detailed regulation on the issue of manure spreading.

The Act on fertilisers and fertilisation of 10 July 2007 describes the rules for manure spreading on land addressed to the IPPC farms (chapter 3):

- Manure can be applied in a way which does not cause a danger to human and animal health or environment.
- The annual manure rate cannot exceed 170 kg of nitrogen per ha.
- An operator of IPPC farm is obliged to have manure application plan (fertilization plan) prepared according to good agriculture practice, based on the chemical composition of manure, the requirements of the crop to be grown, nutrient contents in soil, other organic manures and chemical fertilizers applied.
- The operator which conveys all manure to an external purchaser is exempted from the obligation of having the manure application plan.
- However, in the case of slurry, an operator is obliged to spread at least 70% of liquid manure on cultivated arable land which must be in possession of the operator. The remaining 30% of liquid manure can be conveyed to the external purchaser for agricultural use, only on the basis of a written agreement (*clause of*

nullity). The agreement should be kept 8 years. A purchaser is obliged to prepare a manure application plan before spreading manure, but not later than 30 days after signing an agreement.

- A manure application plan should gain a positive opinion of a regional agricultural-chemical station. (The outcomes of the soil examinations relating to contents of nutrients in soil should be submitted when applying for approval of a manure application plan. The soil examinations should be conducted at least every 4 years). A copy of the approved fertilization plan should be sent to the Voivodship Inspectorate for Environmental protection and the competent local authorities of a commune where fertilization is carried out.
- Manure application is forbidden on areas under water, land covered with snow, land frozen to the depth of 30 cm and during rain.
- Liquid manure application is forbidden on soil without vegetation (plant cover), steep slopes (more than 10%) and during the vegetation period of the plant designed for direct human consumption.
- Manure can be spread on land only by trained staff having a relevant certificate or graduate in agriculture science.
- Slurry and liquid manure is stored in waterproof tanks with capacity enough to store manure by the period of at least 4 months. Tanks should be covered, according to the provision of the Act of 7 July 1994 on Construction Law concerning technical requirements which should be met by agriculture buildings and their location.

Decree of the Ministry of Agriculture of 16 April 2008 *on detailed methods of fertilization and trainings on fertilizers use:*

- Manure is applied evenly on the whole area of the field in a way which excludes manuring of crops and plants not designed for fertilization.
- The spreading rate must be matched to the amount of land available and the requirements of the crop to be grown, other organic manures and chemical fertilizers applied.
- Restriction on spreading manure:
 - Liquid manure and liquid organic fertilizers can be applied between 1 March and 30 November, with the exemption of greenhouses, etc.
 - Manure can be spread only with spreaders, sprinkling machine or tankers used with an umbilical system.
 - Solid manure can be applied only in the vegetation period of plants only on grassland, multiannual agricultural crops not designed for direct consumption by human.
 - Manure must be covered or incorporated into the soil within 24 hours with the exemption of grassland and forests.
 - Manure can be applied in the distance of 20 m from the protection zone of water source, water intake, banks of water reservoirs, watercourses, bathing places located on the surface waters and area of coastal sea belt.
 - Liquid manure can be applied when a ground water level is below 1.2 m, except in areas of shallow fissured rocks.

Problems identified by authorities with regard to setting conditions in permits with regard to manure spreading include:

- Making an accurate assessment of leaching potential in a specific area can be difficult (**Denmark**, Holbaek Municipality).
- Making an accurate estimation of the effect of measures can be difficult (**Denmark**, Holbaek Municipality).
- Confidentiality regarding the location of third party farms used for land spreading can be a problem (**UK**, Northern Ireland).
- There is concern over the practicality/cost of soil testing (particularly where a large number of third party farms are used) (**UK**, Northern Ireland).
- There is concern over the practicality of the notification of changes to nutrient management plans (**UK**, Northern Ireland).
- Permits granted to a number of farmers have been appealed to the courts (**Ireland**).
- The IPPC permit is issued on the basis of the Act on Environmental Protection Law, but manure spreading is regulated by the Act on fertilisers and fertilisation. The implemented legal solutions cause a conflict of competences. An inclusion of information on conditions relating to manure spreading into the IPPC permits for pig farms is a matter of dispute. As a consequence, the conditions of landspreading of manure are not given in the IPPC permit (**Poland**).

4.3 Setting permit conditions and animal housing

Question asked:

What types of conditions have been established in permits relating to animal housing systems? Are there any problems/issues concerning the setting of permit conditions on this issue?

Authorities identified a wide range of conditions that can be set out in permits in relation to animal housing. These are identified in the table below and include:

- General requirements for animal housing to meet BAT.
- A requirement for housing to meet good agricultural practice.
- Limits on specific emissions and odour.
- Measures to reduce emissions and odour.
- Conditions on structure of the housing, including specific floor types.
- Housing conditions for the animals.
- Conditions on ventilation.
- Requirements for energy efficiency.
- Activities within housing, including manure management.
- Specific equipment requirement concerning animal husbandry.

- Feed conditions
- Cleanliness and other general management requirements.
- Requirements on record keeping.

It is also important to note that the operational permits of animal housing may include obligations relating to animal welfare. Although not required under IPPC, these conditions may interact with some of the environmental obligations. An example of such conditions for **Poland** is provided in the Box below.

Conditions for animal housing in Poland for animal welfare

The operator is obliged to meet the requirements of the national legal acts concerning animal housing. The Act on animal protection of 21 August 1997 and the Decree of the ministry of agriculture of 2 September 2003 on minimal conditions of farm animal housing set up the conditions for pig housing. The most important issues covered by the national regulations are:

- Lighting: the pigs are housed in a room which is illuminated at least 8 hours a day with a brightness of more than 40 lux. Light can be artificial or a natural entering through the windows.
- In pigsty air circulation, dusting, temperature, air relative humidity and gases concentrations should be kept on the level safe for animals.
- Automatic ventilation system should be connected with an alarm system and an emergency ventilation system.
- The animals should have permanent access to water.
- Animals receive fodder at least twice a day, adequately to their age, weight physiological state.
- Pigs are housed in the pens or clatters with litter (straw) or without, in an individual- or in group housing -system.
- Pigs cannot be captive (lashed).

Farm animals are housed in conditions safe for animal health and enabling them to keep eye contact with other animals. In the group housing system animals should be in a similar age group. An operator should undertake measures to minimize aggressive behaviour and prevent fights. Animals which are ill, wounded, aggressive or attacked by other animals should be temporally housed in an individual housing system. A pen for pigs should be equipped with materials such as straw, hay, sawdust, wood which can catch animal attention. Material must be safe for animal health.

Minimum standards for protection of sows and gilts before farrowing:

- Sows and gilts in a week before expected time of farrowing can be kept in conditions which ensures that sows have no an eye contact with other animals.
- Sows and gilts should be kept in groups from 4 weeks after service to 1 week before an expected time of farrowing.
- National regulations provide detailed requirements to the pen for gestating sows:

area, materials etc.

- Piglets cannot be weaned from a sow until 29 days after farrowing.
- Weaners are rearing in the pens clean, disinfected, isolated from the pens for sows.

The area and size of a pen for a group/individual housing system is strictly regulated in dependence on the age and weight of animal. For example, the area of a pen are should be:

- More than 6 m² in case of an individual housing system for boar.
- More than 10 m² for mating,
- More than 3.5 m² in case of farrowing sows and piglets,
- More than 2.7 m² in case of an individual housing system for boars and gilts of weight between 30 and 110 kilo.

Conditions	CZ	DE B	DE N	DK V	HU	IE	LV	NL G	PO	RO	SE	SK	UK EW	UK SC
Housing systems must be established in accordance with agricultural data sheets				X										
Housing systems are categorised: fully slatted floor, partly slatted floor with hydraulic (vacuum) or mechanical slurry removal	X													
Use of BAT housing systems with low ammonia and odour emissions				X										
Animal housing should follow BAT requirements	X						X						X	X
When farmer proposes upgrade new housing must demonstrate that it follows BAT						X								
All existing housing must be reviewed to identify aspects not comply with BAT													X	
Improvement plan must be drawn up describing how to upgrade/ replace existing housing, plus timescale													X	
Buildings must be revised periodically					X									
Housing should stay in accordance with rules of good agricultural practice, including animal welfare, suitable food strategy, high sanitary conditions									X		X			
Bedding system									X					
Limits on odour		X	X											
Intense odour feed must not be used		X	X											
Limits on dust emissions		X	X											
Size of animal places must match legal requirements					X									
Sow runs shall be covered					X									
Buildings with solid floors shall be retrofitted with slatted floors					X									
Thermal insulation									X					
Ventilation systems		X	X						X		X			
Handling of manure in the pig house											X			
Use of renewable energy											X			
Energy efficiency									X					
Energy saving lighting					X									
Housing should be designed and managed to minimise emissions														X
Within 24 months of the permit issue, operators must carry out a systematic assessment of existing housing and management practices to identify methods of reducing emissions														X
Buildings shall be modernised to be water saving					X									
Pig fattening units must be equipped with self-feeders to dose the feed economically, as well as anti-spillage drinking systems and automated ventilation					X									
Periodicaly flushing of floors										X				
Flushing systems – not BAT for new installations								X						
Quantity and type of sows, pigs, piglets			X						X		X			
Type of equipment used for cot/stall			X						X		X			
Number of bays in the cot			X								X			
How many pigs per bay			X						X					
Size of bays and cot, how many m2 per pig			X								X			
Kind of feed			X						X		X			
Feed twice a day									X					

Conditions	CZ	DE B	DE N	DK V	HU	IE	LV	NL G	PO	RO	SE	SK	UK EW	UK SC
Kind of ground in different use areas (ie sleeping, feeding)			X						X		X			
Kind and quantity of drinking troughs			X						X					
Permanent access to water									X					
How to deal with ill/hurt animals			X											
Size and percentage of windows			X											
How to deal with / collect manure in the cot			X								X			
How to avoid high concentrations of harmful gas in the cot			X								X			
Black / white separation			X											
Temperature in the cot/stall			X											
Emergency aggregate / alarm equipment			X											
Coefficient of heat transmission / balance of heat flow			X											
Cleanliness and dryness of stall			X											
A minimum of leavings of food			X											
Prepare the food (content of nutrients) depending on requirements of the animals			X											
If litter is used, must be enough in the stall			X								X			
Liquid manure must be removed from the stall continuously or in short time intervals			X											
Must be an odour closure device between the stall and the manure storage equipment outside stall			X											
Type of breeding system									X					
Production cycle									X					
The way animals are stocked									X					
System of removal of manure			X						X		X			
Type of equipment to feed and water the animals			X						X		X			
Clean the floors periodically			X								X	X		
Keep a record of food and water consumption												X		
Notification of any changes must be made to the permitting authority and environmental control authority										X				

Problems identified by authorities with regard to setting conditions in permits with regard to animal housing include:

- There is a difficulty in defining what is BAT, with few reference farms, BAT data sheets, legal definition, etc. (**Denmark**, Vejle Kommune; **France**; **Hungary**; **UK**, England and Wales)
- The flushing channel system is not considered to be BAT for new build systems. However, when changes take place on a farm it is not clear if the old flushing channel system still BAT or are the changes so big that it has to be considered as a new system and is not BAT (**Netherlands**, Gelderland)
- Practicality, cost, timescale for implementation of any required changes for existing housing to meet BAT (**Ireland**; **UK**, Northern Ireland).
- A practical difficulty of collection/treatment for site run-off (**UK**, Northern Ireland).
- Problems were experience with operators meeting deadlines (**Hungary**).

4.4 Setting permit conditions and air abatement

Question asked:

What types of conditions have been established in permits relating to air abatement techniques? Are there any problems/issues concerning the setting of permit conditions on this issue?

Some authorities indicated that they do not set permit conditions relating to air abatement techniques. However, others identified a wide range of conditions that can be set out in permits in relation to air abatement techniques. The particular conditions applied in Poland are provided in the Box below. More generally, conditions identified are set out in the table below and include:

- Specific conditions on individual waste gases (including ELVs) or a general requirement to control emissions.
- Specific emission factors for animals.
- Conditions relating to specific aspects of the installations, e.g. gas engines, etc.
- General requirement to meet BAT and have the necessary cleaning equipment.
- Requirements for good management, e.g. meeting conditions in housing and manure stores that reduce likely emissions.
- Record keeping obligations.

Conditions concerning air abatement required in Poland

Emissions to air must be reduced at each stage of pig production. Operators must obey the following regulations:

1. Animal housing:

- animal breeding according to the rules of pig welfare;
- maintenance of building and facilities in good condition;
- keeping an area clean;
- use of non-bedding system;
- minimization of nitrogen losses by increase in effectiveness of protein use from fodder;
- adjustment of protein contents in fodder to animal needs, use of phase feeding;
- breeding of animal with genetic predisposition to better feed conversion;
- addition of growth promoters to the fodder.

2. Manure storage:

- slurry tanks and other units for manure storage (such as manure channels, pumping station, slurry tanks and manure pad) should be tight to prevent local pollution of groundwater and covered to prevent emission to the air. Control of the technical state of manure storage appliances and routine maintenance of tanks are methods of abatement of air emissions.

3. Spreading manure:

- spreading to land taking into account weather conditions and wind direction;
- avoidance of manure spreading to land at weekends and holidays;
- manure should be mixed with soil in the period of few hours and not later than 24 hours after application;
- farm staff should be systematically trained with the aim to understand the responsibilities of other staff, the impact of the farm on the environment, rules of GAPs and requirements of animal welfare.

4. Conditions of substances emission to the air:

- limitation of annual emission of ammonia and hydrogen sulphide for all individual animal houses located on the farm area (limits are provided in tables);
- take account of the location of the farm and distance from the nearest residential area.

5. Monitoring and reporting requirements

- monitoring of emissions to air (measurements of emission levels should be conducted once a year for two emitters, each emission source should be equipped with two sampling terminals according to national standards);
- monitoring of technical parameters and monitoring of the technical state of appliances (slurry tanks, slurry channels);
- monitoring of the technical state of appliances should be implemented by keeping the records of repairs and reconstructions (scope of works, date) and controlling the technical state of appliances (at least once a year);
- monitoring of technological processes (which determine emission to air) should be carried out by keeping the register of use of fodder mixtures on the farm, the records of both protein and phosphorus concentrations in used fodder mixtures and calculations of real consumption of nitrogen and protein.

Conditions	CZ	DE B	DE K	DE N	DE SC	DK H	DK V	FR	HU	IE	PO	PT	RO	SE	SK	UK EW	UK NI	UK SC
Permits do not involve air abatement systems or is rare				X			X			X				X				X
Demands are set by ammonium and odour emissions				X	X	X												
Regular cleaning of site									X									
Regular maintenance of technical equipment				X									X					
Tightening of all parts of equipment				X														
Capture of all waste gases				X	X													
Conditions on waste gases emitted by gas engines, combustion plants and gas torches				X	X													
Special emission factor for particular types of pigs				X	X													
Anaerobic conditions in manure store must be ensured								X										
When using biogas as a fuel, special conditions are determined				X	X													
ELV for dust, CO, NOx, formaldehyde; in the case of biogas, other fuels				X	X													
Limits on emissions of SO2 and H2S											X							
Operators are being asked to put forward proposals for meeting BAT for slurry storage - this will include a requirement to cover slurry tanks																	X	X
The surface of lagoons must have a natural solid coat to prevent nitrogen emissions													X					
Measures for the reduction of ammonia emissions in accordance with BAT are required (for example: enzymatic preparation, applications on the surface of reservoirs, feed preparations)	X																	
Monitoring and reporting to the permitting authority the measured value of emissions													X					
Exhaust cleaning technology		X	X	X	X													
A control on the fugitive emissions of substances that can cause pollution																	X	
An ammonia emissions reduction plan, where needed																	X	
Technologies should be accordance with BAT									X									
Liquid manure is incorporated into the soil immediately after spreading (see manure spreading)				GBR	GBR				X									
Trees surrounding the site should be cared for, and withered ones replaced									X									
Materials that produce dust should be covered in storage				X					X									
Quantity of emissions				X	X													
Frequency and modality of measurements of emissions				X	X													
Operations diary				X	X													
Annual permissible limit on emissions is given				X	X						X							
Ventilation system				X	X									X				
Bedding											X							

Conditions	CZ	DE B	DE K	DE N	DE SC	DK H	DK V	FR	HU	IE	PO	PT	RO	SE	SK	UK EW	UK NI	UK SC
Feed quality											X							
Fodder must be stored in closed containers															X			
Transport of fodder must be done in a closed way															X			
Manure spreading conditions											X							

Problems and issues identified by authorities with regard to setting conditions in permits with regard to air abatement techniques include:

- Understanding on air scrubbers has progressed beyond what is described in the BREF. The extra use of energy by the air scrubber is identified in the permit, but is more limited than is meant in the BREF. Legal judgement in the Netherlands is that air scrubbers are BAT, if waste water is well used (**Netherlands**, Gelderland).
- The type of air scrubber can make a big difference, but it is hard to require a better one when there are no identified problems with odour or ammonia regulation (**Netherlands**, Gelderland).
- Potential problems could include which monitoring requirements to include in permits (**UK**, Northern Ireland).
- Application of BREFs is difficult (**Hungary**).
- Even when stricter ELVs are allowed to be set, inspectorates rarely make use of this (**Hungary**).
- Air abatement systems are seen as prohibitively expensive (**Ireland**).
- The majority of farms do not have point source emissions - ammonia can be emitted from both housing and manure storage. The cost and difficulty of measuring actual ammonia levels leaving the site and the amount of ammonia impacting on specific receptors, while discounting background levels from other sources, has led to a reliance on modelling, with its inherent inaccuracies. Such complexity leads to frustration among operators - farmers believe they should be able to calculate impacts themselves without hiring expensive consultants (**UK**, England and Wales).

4.5 Setting permit conditions and odour

Question asked:

What types of conditions have been established in permits relating to odour? Are there any problems/issues concerning the setting of permit conditions on this issue?

Many authorities identified a wide range of conditions that can be set out in permits in relation to odour. However, not all do so. For example, in **Poland** there are no conditions set specifically with regard to odour as there is no legislation yet in place to do this. Conditions may be set out in various ways:

- They can be established as general requirements in national law.
- They can be set out in general binding rules specifically for aspects of pig farm activity.
- The conditions can be prescribed on a case by case basis in bespoke conditions in the permit.

In a number of cases, permits may contain bespoke conditions as well as refer to general legal obligations. The types of conditions that are set are identified in the table below and include:

- Specific quantified odour levels in the local environment that must be met.
- Specific distances to neighbours required.
- General requirement to avoid nuisance in the local area.
- Limits to the general activity of the installation (numbers of animals).
- Obligation to identify odour sources and take necessary action.
- Specific good management requirements on housing, manure storage and spreading, as indicated above, in particular with specific limits on when spreading can occur directed at reducing odour events.
- Record keeping of site operation and of complaints.

Conditions	CY L	CZ	DE B	DE N	DK H	DK V	HU	IE	LV	PO	PT	RO	SE	SI	SK	UK EW	UK NI	UK SC
aspects of operation where it is not directly addressed by another condition in the permit																		
BAT must be applied							X											
Cleanliness and dryness of stable (see also housing systems)			X	X														
Use of food enzyme technology with 30% efficiency															X			
Use fodder with low protein content															X			
Nutritional management												X	X					
<i>Spreading (see also manure spreading)</i>																		
No spreading in the evening or during holidays on wet days															X			
Incorporation must take place within 24 hours of landspreading													X		X			
Immediate incorporation after slurry spreading			GBR	GBR			X					X	X					
Natural odour barrier, i.e. line of trees, shall be planted							X											
Sensitive to wind direction while spreading							X						X	X				

Problems identified by authorities with regard to setting conditions in permits with regard to odour include:

- Reduction in stock numbers or odour emissions were required in a number of permits and are currently subject to appeal (**Ireland**).
- Ensuring compliance is proving difficult - in demonstrating the odour is coming from the permitted site (**UK**, England and Wales).
- Detection of odours can be complicated by local (and unrelated) landspreading and seasonality (**UK**, England and Wales).
- Lack of legal enforcement of BREF (**Hungary**).
- Cost of enzymes is an issue. The food producers do not guarantee to what extent the enzyme addition reduces odour (**Slovakia**).

4.6 Other issues

Question asked:

Are there any other concerns about or issues raised in setting permit conditions?

Other issues and comments made in relation to setting permit conditions raised by authorities included:

- All IPPC permits issued for existing pig farms contain timescales for upgrading. For those which did not meet BAT requirements, the permits contain conditions and deadlines for manure storage, manure handling, manipulating animal behaviour with floor heating, ventilation, cleaning of stables, measures to ensure that the manure stay in the manure canal the shortest time possible, etc. and if the farm is close to inhabited areas, additional measures to prevent odour. Pig farms generally have problems with building the necessary closed, insulated, covered manure storage tanks and with odour emissions. Almost all the permits were issued by the 30 October 2007 deadline (96% of all the IPPC installations had permits and only 6 of the existing pig farms did not meet the deadline). Many pig farms had an extension of 36 months for building the necessary manure storage facilities, financed by the EAFRD. This extension is not valid for the other obligations laid down in their permits (**Hungary**).
- Despite agreements with farmer representative bodies there is still opposition to what has been agreed (**Ireland**).
- How detailed (and how long) must the permit document be? It is important that it is readable (**France**).
- Achieving some aspects of BAT to tackle problems is difficult, so that the main solution is to reduce the number of animals (**Denmark**, Vejle Kommune).
- Other issues could include requirements for monitoring emissions to water e.g. effluent from slurry separation/treatment (**UK**, Northern Ireland).
- Differences between Member States in setting permit conditions can occur beyond what is explicitly BAT, such as minimum distances between farms and dwelling areas are not prescribed through spatial planning and land spreading conditions (**Slovenia**).

- There are several permit applications which have been refused due to an inability to achieve the minimum emission levels in wastewater discharges and due to the environmental impact assessment (**Portugal**).
- The conditions require sufficient financial resources (e.g., rebuilding of animal housing, manure storage etc.), which can be problematic (**Latvia**).
- There is a need for setting guidance values of ammonia emissions and nitrate leaching (**Sweden**).
- In some areas there is not the adequate land available locally to recover the slurry generated. Therefore it must be transported significant distances or it will be applied to land at application rates in excess of plant needs (and/or legislative limits). Slurry treatment options are limited and may not generally remove nutrients (**Ireland**).
- The interpretation of ammonia impacts on sensitive habitats is problematic, particularly when there is little or no evidence of impacts (**UK**, England and Wales).
- Priorities may occur with regard to nature conservation and water rights (means water law) (**Germany**, Schwerin).
- Other important conditions in the permit (beside conditions concerning the building, monument conservation, waste treatment and employment protection) are related to noise and nature conservation. For noise the conditions are very similar to the conditions concerning odour. For nature conservation, damage requires compensatory measures. These measures are one of the most important conditions for nature conservation in the permit (**Germany**, Neubrandenburg).
- The legal status of ancillary provisions needs clarifying (**Germany**, Kassel).
- Wastewater is a problem - is it the most appropriate solution to lead wastewater to the manure store? (**Estonia**)
- The total noise emissions from pig facilities, including vehicle traffic and loading and unloading has a limit set at the nearest residential building of daytime 49 dB (A) and at night 31 dB (A). These data are only an example of one permit. Generally in the permit there are noise immission values. But the value depends on the site / surrounding. During construction and operation of the entire system state of the art noise reduction by sound technical and structural measures is required (**Germany**, Stralsund).

5. MONITORING AND REPORTING

5.1 Monitoring, reporting and manure storage

Question asked:
Are there specific monitoring and reporting requirements relating to manure storage? Are there issues for operators in meeting these requirements? Do the authorities have sufficient tools to demand monitoring and reporting?

Authorities usually require operators to monitor and report on a range of issues relating to manure storage, although some indicate no requirements are set in permits (e.g. **Netherlands**, Gelderland). However, some state that specific monitoring on manure stores is not required. Details are given in the table below. Some respondents referred to inspection within the context of monitoring. These issues are addressed in section 9 of this report.

In many cases operators are required to produce a periodic report of their activities, e.g. an annual environmental report. This covers the range of reporting issues addressed by the questionnaire. In other cases the periodicity or nature of the reporting is not specified.

Key issues that require monitoring can include:

- Overall conformity with specific permit conditions.
- Manure storage conditions and integrity of the storage (e.g. leaks).
- Analysis of treated effluent.
- Record keeping of manure generated and other issues, e.g. in the form of a log book.
- Incidents of complaints.
- Water consumption.
- Waste water generation.
- Emissions to air, surface and ground waters.
- Soil monitoring within enclosure units.
- The ongoing capacity of the manure stores.
- Progress with upgrading, if required.

Where indicated, authorities consider that they have sufficient tools available to require monitoring of different aspects of manure storage.

Member State/ authority	Monitoring and reporting requirements related to manure storage
CY	There are specific requirements for the monitoring of manure and treated slurry (effluent) storage. Operators should submit an annual report, which

	includes: the conformity with permit conditions, chemical analysis of treated effluent, record keeping for daily irrigation of treated effluent, record keeping for manure land used, complaints. The authority has sufficient tools through record keeping, the implementation of the environmental management system, the implementation for prevention and control of pollution accidents and the ability for receiving legal measures in cases of non-conformance.
CZ	The permit specifies methods of emission monitoring and requirements for recording, reporting and a requirement for compliance with the plan for manure application. Evidence and reporting of manure application and waste application is also required as well. An annual report on waste production is required.
DE – N	The operator has to check manure storage conditions and record it in a log book which is checked regularly by the authority.
DK – V	A log including notes on natural coverage of liquid manure is demanded by law. There are sufficient tools to demand monitoring and reporting.
EE	The operator has to report on water consumption, wastewater generation, waste generation, air emissions quarterly and annually.
FR	The operator has to monitor the water tightness of the storage.
HU	A wide range of aspects require monitoring and reporting, detailed in the box below.
IE	Operators are required to monitor the level of slurry in storage at a specified frequency, i.e. monthly, in the storage tanks. Tanks are also to be tested (for integrity). However, there are difficulties in relation to how this should be done.
LV	In general there are no specific monitoring requirements for manure storage. In the case of complaints testing of odour and compliance to national odour legislative is required.
PL	<p>There is a lack of obligations related directly to the monitoring of manure storage. Operators are obliged to register the amount of produced manure and the amount of both manure spreading on the field and manure conveyed to external purchasers and there are other relevant obligations relating to the monitoring and reporting imposed on operators:</p> <p><i>Monitoring of water intake:</i> Daily control of the amount of water intake – every day at the same time. Water intake needs should be registered by inner water meter installed in an individual pig house, water-meter reading should be carried out once a day.</p> <p><i>Monitoring of groundwater quality:</i> Control of the impact of installation on the groundwater by monitoring of nutrients concentrations in groundwater on the farm area, which must be carried out twice a year. The following parameters have to be measured twice a year: pH: acidity, biological oxygen demand BOD5, chemical oxygen demand COD, ammonium-N, nitrate-N, nitrite-N, total nitrogen, organic nitrogen, phosphates, potassium, and once a year: sulphides, chlorides, magnesium, manganese, sodium, dissolved substances, total solids, calcium, iron, cadmium, copper, chromium, lead, nickel, zinc.</p> <p><i>Manure management monitoring:</i> The current register of amount of manure produced on the farm, stored and removed out the farm. Operators are obliged to register the amount of produced manure and the amount of both manure spreading on the field and manure sent off to external purchasers.</p> <p><i>Monitoring of technical state of appliances:</i> The monitoring of technical state of slurry channels, slurry tanks, lagoons must be carried out at least once a year. The operator is obliged to keep the current register of conducted repairs where the description of work and date are done. Monitoring of technical state of appliances should be implemented by keeping the records of repairs and</p>

	<p>reconstructions (scope of works, date) and controlling a technical state of appliances (at least once a year)</p> <p><i>Monitoring of technical parameters:</i> Monitoring of technological processes should be carried out by keeping the register of use of fodder mixtures on the farm, the records of both protein and phosphorus concentrations in used fodder mixtures, calculations of real consumption of nitrogen and protein.</p> <p><i>Record keeping:</i> records of monitoring and results of technological monitoring should be kept for 5 years after the end of the relevant year.</p>
PT	The manure and the agriculture land used for spreading have to be analysed twice a year. In the farms that have lagoons and have wastewater discharges for land or rivers operators have to analyse these wastewaters three times a year. There are no exceptions for the monitoring. All plants have to present the results to the local authority and have to send an annual report to the national authority.
RO	Soil monitoring is required within the enclosure of units, especially in the area of manure storage tanks (once a year) for: organic carbon, pH, total nitrogen. This is reported in an Annual Environmental Report.
SE	An annual environmental report is required where the farmer has to show how all the permit conditions and other obligations are fulfilled. The operator also has to report the size of storage of manure and that it can store manure for 10 months.
SI	Manure storage does not have any specific monitoring or reporting requirements.
SK	<p>The operator is obliged to test of all stores for liquid manure every 10 years and report the results. The operator must undertake regular control and maintenance of the manure sewerage system, pumping manure system and overflow monitoring to prevent manure leaks to ground water or subsoil and to keep an account of it once a month.</p> <p>The operator is also obliged to check the liquid manure level in underground storages regularly and once a month to keep an account of it.</p>
UK- EW	Manure storage does not have any specific monitoring or reporting requirements. However, the emissions from stored manure must be reported as part of the annual Pollution Inventory return.
UK- NI	To date permits have required operators to provide proposals on how manure storage facilities will be checked for leaks i.e. integrity testing. There are potential practical issues in this regard – what degree of integrity testing should be required, etc.?
UK- SC	Monitoring and reporting of slurry storage is not required. Operators have however been asked to take a close look at their manure and slurry holding arrangements and demonstrate that they have at least 6 months storage on site. This level of storage can be reduced (in some areas) following preparation of a farm waste management plan demonstrating that some lower level of storage capacity is sufficient in that case. The authority has sufficient tools to require monitoring and reporting should it be felt necessary.

Hungary: Monitoring and reporting requirements relating to manure storage

As a consequence of the activity of pig farming, surface, groundwater and soil could be considered as potentially vulnerable. Therefore the monitoring requirements are the most robust for these media. In 2008 the operation of the national monitoring network has begun to control nitrate pollution in water and the eutrophication status in

surface waters. Legislation sets out monitoring obligations in IPPC permits. The permit holder should report its data at least once a year if the inspectorate does not provide for another reporting frequency. There are sanctions specified in each medium specific legislation for non-compliance with the data supply requirements.

Examples of monitoring requirements from permits concerning manure storage are:

- The monitoring system examining the impacts of the farm on the environment has to cover the development of a control and maintenance programme concerning the technical status of the farm's installations (sewage collecting equipments, slurry collecting and treatment facilities, ventilators, etc.), and the measurement of water consumption (monthly).
- Technological objects built in the phase of retrofitting have to be designed and built in a way, so that the monitoring of previously detected and future potential pollutants to soil and groundwater would be solved.
- The impact of a pig farm and liquid manure storage facility on water resources has to be monitored with a system established within a stated deadline.
- To control the impact of the installations on ground water—until being brought to use— monitoring wells have to be built in the direction of the groundwater flow. From the monitoring well an annual examination has to be carried out for the following parameters in water: pH, specific conductivity, chloride, ammonium, nitrite, nitrate, sulphate, phosphate. The results have to be sent to the inspectorate every year.
- The activity shall be carried out under controlled circumstances, therefore monitoring wells have to be built (next to the liquid manure storage tank and next to the sewage pit), in order to track the state of groundwater. Monitoring wells have to have a water permit, its permit application and the attached permitting plans have to be submitted to the inspectorate after the decision has entered into force.
- Every half year the water level has to be measured in the wells, and the following chemical parameters of groundwater have to be determined in an accredited laboratory: pH, specific electric conductivity, CODps, nitrite, nitrate, chloride, ammonium, phosphate, sulphate). The results of examination have to be submitted to the inspectorate as part of the evaluation report every year. The sampling and analysis have to be carried out by accredited bodies according to specific standards. If there is a sudden change in the measurement results, the inspectorate has to be contacted immediately.
- Water quality examinations of the wells have to be carried out annually, for the following components: pH, alkalinity, electric conductivity, ammonium, nitrite, nitrate, calcium, magnesium, sodium, potassium, total phosphorus, phosphate, sulphate, chemical oxygen demand. Prior to water sampling the still water level of wells has to be measured. The sampling and examination of samples has to be carried out by an accredited body. After reconstruction works the monitoring system has to be extended so that the system will be capable of controlling the environment of the liquid manure tank.

An example of the reporting obligations is given below:

Data reporting, name of report	Data reporting,	Deadline of
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	frequency of report	submitting
Annual reporting		
Annual waste report (hazardous, non-hazardous)	annually	1 March
Case by case reporting		
Complaints (if there were any)	case by case	one month after the complaint
Summary of reported occurrences	case by case	one month after the occurrence
Minimal content of an annual environmental report		
Waste management: • waste generated • material balance	case by case	31 March
Air quality protection: • Examination of the composition of the feed, indicators of the effectiveness of feed utilization		
Water protection: • changes planned in the current technology • actual water and other material usage • quantity of sewage and other emitted substances • monitoring system examination (groundwater examination report)		
Summarizing report of complaints		
Summarized report of reported occurrences		
Trainings concerning environmental protection	Every 5 years	
Examination of alternative management technologies in connection with manure/slurry management		
Energy audit (investigations clarifying losses)		

Since 2008 for organisations or a person carrying out agricultural activities, where manure is generated or is in use, an extra reporting obligation exists, which requires the following information:

- data on the person carrying out agricultural activities
- data on the animal farm
- yearly number of animals and the quantity of manure produced
- capacity of manure storage and the quantity of manure stored on the last day of the year
- the size of the grazing area
- data on manure application

- statement concerning manure given to other producers, or bought from others

5.2 Monitoring, reporting and manure spreading

Question asked:

Are there specific monitoring and reporting requirements relating to manure spreading on land? Are there issues for operators in meeting these requirements? Do the authorities have sufficient tools to demand monitoring and reporting?

Authorities usually require operators to monitor and report on a range of issues relating to land spreading of manure. However, some state that controls on land spreading, particularly within IPPC, can be limited, so that monitoring requirements are also more limited. Details are provided in the table below.

Key issues that can require monitoring include:

- Overall conformity with permit conditions/nutrient management plan.
- Nutrient levels in manure.
- Timing of manure application.
- Monitoring of soil quality.
- Monitoring of water courses.
- Recording of complaints.

Member State/ authority	Monitoring and reporting requirements related to manure spreading
CY	Operators should submit an annual report, which includes: conformity with permit conditions, chemical analysis of treated effluent, record keeping for daily irrigation of treated effluent, record keeping for manure land used, complaints.
CZ	Checking of the plan for manure application. Other demands of the monitoring are secured by relevant laws.
DE – N	In Mecklenburg-Vorpommern the Ministry of Agriculture and Environment requires that each year at least 1% of agricultural companies spreading manure have to be checked regarding the manure law and 1% have to be checked regarding cross compliance. The companies are chosen by random or if there is a good reason to check one company in depth. Also regularly farmers have to show the results soil analysis and nutrient calculations before and after the vegetation period.
DK- H	Operator must submit an account of applied manure and fertilizer each year. The account must be kept for 5 years and presented at inspection.
DK – V	Operators must keep account of the use of manure every year. The account is mainly based on nitrate. There is no demand regarding consumption of phosphorous in fertilizers and this can be difficult to control if there is a demand concerning this in a specific permit.
EE	The operator has a field book detailing obligations for manure spreading. This must record the fields where spreading occurs, the amount used, crops grown, etc. This is submitted to the inspector.

FR	The spreading is planned before a specific date (provisional fertilization plan) and written in the fertilization book at least one month after it is done.
HU	Requirements of the national monitoring network to control nitrate pollution in water and the eutrophication status in surface waters apply.
IE	Operators are required to record movement of slurry off the pig farm and identify what farm it is delivered to, maintain a record on-site and to provide a summary to the authority annually. The controls on the farm where the slurry is to be spread are the responsibility of the land owner rather than the pig farmer, controlled and enforced by other government departments.
LV	Before manure spreading operators must test the soil (content of phosphorus, nitrogen etc.) and monitor groundwater (total nitrogen, chemical oxygen demand (COD)) to ensure the correct dose of manure is applied.
PL	Examination of nutrient content in manure before spreading on land. Monitoring of soil quality covers the tests of quality of soil and earth: soil tests on the content of nutrients should be carried out every four years, by a local Chemical Agriculture Station. Monitoring of surface water is carried out when necessary or where are small water reservoirs, in the scope of parameters of eutrophication. The water quality tests must be carried out twice a year, before manure spreading and after the last spreading in the year. The current register of amount of manure produced on the farm, stored and removed out the farm. The operators are obliged to register the amount of produced manure and the amount of both manure spreading on the field and manure sent off to external purchasers. In the Western-Pomeranian Voivodship the reporting rules concerning manure spreading on land have been worked out by the Voivodship Inspectorate for Environmental Protection together with pig farms operators. The operators are obliged by the inspectorate to keep the sheets of the liquid manure application. The operators keep the register of manure spread on land, which is checked out by inspectors during the control. The register enables to check the accordance between the amount of manure spread on field with the manure application plan. Records of monitoring and results of technological monitoring should be kept for 5 years after the end of the relevant year.
PT	There are problems in this area due to the lack of a database.
RO	Twice a year water samples are taken from plots where manure was spread, the following parameters are analyzed: pH, ammonia nitrogen, oxidability, nitrates. Once a year soil samples are taken from the cultivated lands where manure was spread, the following parameters are measured: organic carbon, pH, total nitrogen. Operators have to keep a management report of manure arising where they have to write to whom they gave manure, what quantity of manure and field application of manure and inorganic fertiliser.
SE	An annual environmental report is required where the farmer has to show how all the permit conditions and other obligations are fulfilled. In the report the operator has to report on manure spreading.
SI	There are no requirements to monitor or report manure spreading. There is a requirement to record all manures spread on land managed by the operator.
SK	The farmer is obliged: <ul style="list-style-type: none"> • every 5 years to undertake analysis of the land where spreading is made and present it during the inspection.

	<ul style="list-style-type: none"> • every year analyse the manure (content of nitrogen and phosphorus) before spreading and present it during the inspection. It may also be required by agricultural authorities. • monitor ground water once a year according to specific conditions. • measure the amount of manure, its structure, how handled, or how much and to which person it was sold. • tell the authority about all accidents concerning ground or surface water caused by manure and to keep an account of them.
UK- EW	There are no requirements to monitor or report manure spreading. There is a requirement to record (and keep the records for inspection for 6 years) all manures spread on land managed by the operator. This includes the amount spread, an analysis of the manures and the nutrient status of the soil on the receiving land.
UK- NI	<ul style="list-style-type: none"> • Demonstrate that manure is applied in accordance with the nutrient management plan; • Undertake review of soil nutrient analysis in particular phosphorus; maintaining records of manure movements; • Notification of changes to plans.
UK- SC	No requirements.

5.3 Monitoring, reporting and animal housing

Question asked:

Are there specific monitoring and reporting requirements relating to animal housing? Are there issues for operators in meeting these requirements? Do the authorities have sufficient tools to demand monitoring and reporting?

Many Member State authorities do not indicate that there are specific monitoring or reporting requirements in IPPC permits with respect to animal housing. However, some state that there are monitoring obligations on animal health that may be required by veterinary authorities and monitoring of pig numbers for agricultural authorities.

Monitoring and reporting for IPPC obligations, where these are required, are usually required for changes to housing, either through required upgrades or periodic updating. Otherwise, specific requirements relate, where these occur, to the standard performance of housing. The table below lists some of the requirements that are reported for animal housing. Where no specific obligations are established, a number of authorities stress that they do have the powers to impose such obligations if they were required.

Member State/ authority	Monitoring and reporting related to animal housing
CZ	Checking of the operational order.
DK- H	Precise registration on site of pig numbers. Movement of animals in and out must be recorded to present at inspection
DK – V	Permits can contain demands concerning conditions on the establishment of housing systems according to agricultural data sheets and running of the systems. It is a challenge to set demands on monitoring and reporting of new techniques or housing systems that are practicable and not too expensive.
FR	Every ten years, the operator has to transmit a working check-up (“bilan de fonctionnement”) to the competent authority (Direction départementale des services vétérinaires). This details the housing systems, the techniques employed for environmental protection (BAT or equivalent), the results of the monitoring, etc.
HU	Operators have to report on periodic revisions to the state of the housing to ensure that it meets technical specifications and that this is certified. This is to be reported to the inspectorate.
IE	Permits for poultry rearing activities require the operator to inspect the integrity of the floors of all deep litter houses after each wash down and shall undertake remedial actions to repair any damaged or cracked floors as necessary. They shall also maintain a record of all inspections and remedial actions taken.
LV	No specific requirements related to housing. Permit conditions require calculations of air emissions on regular basis to ensure compliance.
PL	<p><i>Monitoring of water intake:</i> Daily control of the amount of water intake – every day at the same time. Water intake for the farm needs should be registered by inner water meter installed in an individual pig house, water-meter reading should be carried out once a day.</p> <p><i>Manure management monitoring:</i> The current register of amount of manure produced on the farm, stored and removed out the farm. Operators are obliged to register the amount of produced manure and the amount of both manure spreading on the field and manure sent off to external purchasers.</p> <p><i>Monitoring of emission to air:</i> The monitoring of emission to the air, which can be done by keeping the register of use of fodder and protein content in fodder and calculation of emission to the air of ammonia and hydrogen sulphide. Monitoring of emission to the air (measurements of emission levels should be conducted once a year for two emitters, each emission source should be equipped with two sampling terminals according to national standards).</p> <p><i>Monitoring of technical state of appliances:</i> The monitoring of technical state of appliances must be carried out at least once a year. The operator is obliged to keep the current register of conducted repairs where the description of work and date are done. Monitoring of technical state of appliances should be implemented by keeping the records of repairs and reconstructions (scope of works, date) and controlling a technical state of appliances (at least once a year)</p> <p><i>Monitoring of technical parameters:</i> Monitoring of technological processes should be carried out by keeping the register of use of fodder mixtures on the farm, the records of both protein and phosphorus concentrations in used fodder mixtures, calculations of real consumption of nitrogen and protein. The obligations concerning monitoring of technological processes covering the following issues are imposed on operators in IPPC permits:</p>

	<ul style="list-style-type: none"> • amount of fodder used by an individual production group of pigs, • contents of proteins and total phosphorus in fodder, • number of animals produced on the farm, • amount of slaughter animals produced on the farm. <p><i>Monitoring and reporting on the number of pigs:</i> A number of pigs are subject to each inspection. The operators keep the register of livestock where a number of animals is recorded daily. Movement of animals in and out must be monitored and reported. The Agency of Modernisation and Restructuring of Agriculture (ARiMR) controls the total number of pigs on the farm. Operators are obliged to submit at least once a month information on any changes in a pig herd, such as a number of animals which were purchased, conveyed, dead etc. The ARiMR keeps the record of pigs as well as other household animals. During the control process on the farm a general and an annual number of pigs is checked.</p> <p>The authorities have sufficient tools to demand monitoring and reporting on animal housing. Records of monitoring and results of technological monitoring should be kept for 5 years after the end of the relevant year.</p>
SE	Minor changes of the housing system are reported to the authority.
UK- EW	There are no monitoring or reporting requirements but all emission points from animal housing are identified in the permit schedules which are covered by a permit condition covering emissions. While farms currently have no emission limits set and thus no need to report, the permit could be varied to allow these to be included and pre-existing conditions exist that cover both the requirement to carry out monitoring and the requirement to submit reports.
UK- NI	There are generally no monitoring requirements, e.g. of emissions, however, permits could be varied if necessary to include appropriate conditions. Review of existing housing systems is required to assess compliance with BAT – practicality/cost /timescale for implementation of any required changes.
UK- SC	No monitoring requirements, e.g. of emissions, due to cost, but the authority has the powers to ask for this if needed.

5.4 Monitoring, reporting and air abatement

Question asked:

Are there specific monitoring and reporting requirements relating to air abatement techniques? Are there issues for operators in meeting these requirements? Do the authorities have sufficient tools to demand monitoring and reporting?

A number of authorities indicate that monitoring is not required for operators for air abatement techniques (**Denmark; Estonia; Germany; Ireland; Portugal; Romania; Slovakia; Sweden; UK**, Northern Ireland, Scotland). However, it should be noted the earlier comment concerning the understanding of ‘technique’. The Box below sets out the detailed requirements required in **Poland**.

Specific monitoring obligations that are required include:

- Efficiency of air abatement systems should be reported, with operators using certified companies to assist them (**Netherlands**, Flevoland)
- Registration of the time the pumps work, half yearly measurement of the washingwater (chemical scrubbers), periodical maintenance and control of the scrubber and efficiency measurements (**Netherlands**, Gelderland)
- Ammonia measurement (**Czech Republic**)
- Reporting annual air pollution control data (**Slovenia**)
- Reporting annual air pollution control data (**Hungary**)
- Declaration by the farmer of ammonia emissions (**France**)

Slovenia also notes that emissions monitoring must be undertaken by prescribed laboratories, sampling points be in compliance with prescribed standards and data provided to authorities on an annual basis.

The **UK** (England and Wales) notes that modelling is used to assess ambient pollution concentrations particularly for sensitive habitats. This is used to direct emissions reductions plans and could be verified by monitoring in theory, although there are questions over the statistical robustness of the data. Other respondents also noted various problems in setting monitoring requirements, including level and type of monitoring (**UK**, Northern Ireland), practicalities of undertaking monitoring (**UK**, Northern Ireland) and too little experience (**Germany**, Schwerin).

Monitoring requires in Poland with respect to air abatement

Monitoring of emissions to air

The monitoring of emission to the air can be done by keeping the register of use of fodder and protein content in fodder and calculation of emission to the air of ammonia and hydrogen sulphide. Monitoring of emissions to the air (measurements of emission levels should be conducted once a year for two emitters, each emission source should be equipped with two sampling terminals according to national standards).

Monitoring of technical state of appliances

The monitoring of the technical state of slurry channels, slurry tanks, lagoons must be carried out at least once a year. The operator is obliged to keep the current register of conducted repairs where the description of work and date are done. Monitoring of technical state of appliances should be implemented by keeping the records of repairs and reconstructions (scope of works, date) and controlling a technical state of appliances (at least once a year)

Monitoring of technical parameters

Monitoring of technological processes should be carried out by keeping the register of use of fodder mixtures on the farm, the records of both protein and phosphorus concentrations in used fodder mixtures, calculations of real consumption of nitrogen and protein.

The operators are obliged to carry out the annual control measurements of both ammonia and hydrogen sulphide emission to air. The ammonia emission is estimated on the basis of amount of fodder used and contents of proteins in fodder. Such a method is considered as adequate to assess the emissions. The monitoring of ammonia and hydrogen sulphide emission to air should be carried out indirectly by registration of fodder used and contents of proteins in fodder and estimation of emission. However, the estimated emission should be confirmed by analysis. The emitters should be constructed in a way, which enables to take samples for analysis.

The obligation has been binding from 2008. Initially, operators had difficulties in finding a certified laboratory to sample and carry out analysis of NH_3 and H_2S . Consequently, the operators had problem with meeting the requirements concerning emission monitoring. Moreover, some IPPC farms having excessive emissions are obliged to report on emission under the PRTR regulation.

Monitoring, reporting and odour

Question asked:

Are there specific monitoring and reporting requirements relating to odour? Are there issues for operators in meeting these requirements? Do the authorities have sufficient tools to demand monitoring and reporting?

Many respondents state that there are no specific monitoring requirements with respect to odour directly (unless, possibly, there are complaints). These include **Czech Republic; Denmark** (Holbaek and Vejle Kommunes); **Estonia; France; Latvia; Netherlands** (Flevoland); **Portugal; Poland; Slovakia; Sweden** and the **UK** (all parts). However, **Poland** notes that monitoring of ammonia can relate to odour, as does the **Netherlands** (Gelderland) where odour issues result in one case of monitoring. The **Czech Republic** states that rules are currently under preparation.

Some respondents indicate that monitoring requirements can be applied. **Hungary** states that odour monitoring can be set out in the permit. **Germany** (Neubrandenburg) states that regulations set out requirements for monitoring and reporting of emissions and ambient concentrations of odour. This would be undertaken by technical consultants and checked by the competent authority.

The **UK** (England and Wales), while not requiring odour monitoring itself, may require the operator to monitor climate factors as part of tasks undertaken relating to odour generation and control (e.g. cleaning sheds and operating ventilation systems). **Ireland** notes that permit conditions require the avoidance of nuisance and, therefore, recording odour complaints is a type of odour assessment monitoring.

Competent authorities may undertake monitoring of odour emissions themselves if they consider that there is a problem. This is specifically noted by **Denmark** (Holbaek Kommune), **Germany** (Brandenburg, Stralsund, Schwerin) and **UK** (Scotland), although **Denmark** (Vejle Kommune), **Germany** (Schwerin and Stralsund) and **UK** (Northern Ireland) note that there are problems in identifying practical, inexpensive methods that could be used on a daily basis by an authority due to the complexities of measurement. Assessment following odour complaints is examined in more detail below when considering inspection.

5.5 Other issues concerning monitoring and reporting

Question asked:

Are there any other concerns about or issues raised concerning monitoring and reporting?

The following additional issues concerning monitoring and reporting were raised by respondents:

- A number monitoring methods that could be prescribed require much effort, expertise and are expensive, thus presenting constraints on their use or acceptability (**Denmark**, Vejle Kommune)
- The **Netherlands** (Flevoland) raised a concern over the sufficiency of knowledge in the competent authority to interpret monitoring results.
- Farmers have raised concerns over the confidentiality of information required for reporting, such as nutrient plans, so that such data are stored at the installation rather than on public file (**Ireland**)
- Where ammonia emissions are controlled to protect sensitive habitats, monitoring of the effectiveness of abatement could be problematic (**UK**, Northern Ireland), as can be the assessment of nitrogen inputs to ecosystems (**Germany**, Schwerin)
- There is a problem linking monitoring to fertiliser planning, which is difficult to check (**France**)
- There is a need to link monitoring and reporting to the requirements of E-PRTR (**Hungary**; **Germany**, Brandenburg)
- Other factors such as technical changes, energy consumption, water use, waste management, etc., have to be monitoring and reported (**Czech Republic**; **UK**, Scotland). In **Estonia**, for example, the operator has to analyse water once a quarter and report the results.
- Where accidents/incidents occur, farmers have to report immediately (**Sweden**; **UK**, Scotland) as well as the need generally to report on safety issues (**Germany**, Neubrandenburg)

6. INSPECTION

6.1 Inspection frequency

Question asked:

Are pig units subject to any particular frequency of inspection? If so, what? How has this been determined?

Inspection authorities undertake planned and unplanned inspections. The latter arise as the result of complaints or other incidents and most respondents note that these could occur at any time. The former take place at varying frequencies across the Member States. These frequencies are set out in the table below. It can be seen that these can vary from several inspections per year (which is rare) to, more commonly, once per year, or, equally commonly, once every 3-4 years or so. **Denmark** (Vejle Kommune) and **France** indicate a different frequency depending on the size of the pig farm.

The basis for inspection frequency is determined in various ways. In some cases the frequency may be set in law (**Hungary**) or derived through agreement between national and municipal authorities (**Denmark, Poland**). In **Poland** inspections are carried out on the basis of the national guidelines for inspectors, prepared by the Chief Inspectorate for Environmental Protection at the national level and is binding for inspectors in all the country. In 2009 a national inspection control cycle on IPPC pig farms is being carried out.

Other factors determining inspection frequency include available human resources (**Cyprus**). However, a number of Member States stress the importance of keeping inspection frequencies under review or in the use of risk-based approaches. **Sweden**, for example, focuses inspection on farms with higher environmental impact (therefore, not reporting any specific inspection frequency). The importance of risk-based approaches is also reported by the **Czech Republic, Cyprus, France, Romania** and the **UK** (all authorities). **Hungary** specifically states that a risk-based approach is not yet developed. In the **UK** risk assessment considers issues such as environmental impact as well as the past compliance history. The England and Wales Environment Agency, for example, has a formalised risk-appraisal tool – OPRA. In **France** the inspectorate also assesses risk both on the basis of the level of environmental impact and history of compliance.

A number of aspects of operation of pig farms may also be checked by veterinary inspectors (**Germany**) and, indeed, **Latvia** states that inspection is the subject of animal welfare and not environmental inspection.

Member State/authority	Inspection frequency
CY	Once per year
CZ	Varies
DE – B	Once every 2 years
DE – N	Once every 4 years
DE – SC	Once every 4 years
DE – ST	Once every 4 years
DK- H	Once every 3 years
DK – V	>75 animal units: once every 3 years <75 animal units: once every 6 years 75 animal units equates to about 210 sow places or 710 pig places
EE	Once per year (installations >2,000 pigs or 750 sows). Installations with fewer pigs – inspected less regularly
FR	Once every 3 years for IPPC installations Once every 7 years for smaller installations
HU	At least once per year
IE	Once or twice per year
LV	Not subject to environmental inspection
NL – F	Once every two years
NL - G	Twice per year
PO	Usually once per year, sometimes once every two years
PT	Once every 2-3 years
RO	Twice per year
SE	Once or twice a year
SK	Once every 2 years
SI	Once per year
UK- EW	Twice per year initially
UK- NI	Twice per year
UK- SC	Between 1 and 4 per year

6.2 Inspection and manure storage

Question asked:

Are inspections on manure storage carried out? How? On which issues will the inspection focus, e.g. specific operational aspects, emissions or other impacts? In case of non-compliance, what are the main issues? What further actions will the authorities undertake to enforce compliance on this issue?

Manure storage is the subject of inspection across the Member States given that effective manure storage is necessary to prevent significant environmental impacts. The following table lists the issues identified by the authorities respecting manure storage. The conditions listed are unlikely to be exhaustive. However, they can be characterised as addressing the following:

- Are the manure stores of sufficient capacity?
- Type of store

- Condition of the store to prevent emissions/leaks (corrosion, seals, etc)
- Testing of manure/slurry contents
- Environmental testing (soils, waters)
- Record keeping

Most inspectorates include visual inspection of the technical operation/capacity of the manure store and checking records. Some undertake further testing.

Member State/ authority	Conditions inspected
CY	<ul style="list-style-type: none"> • Conditions in Waste Disposal Permit
CZ	<ul style="list-style-type: none"> • Storage capacity and utilisation
DE – B	<ul style="list-style-type: none"> • Technical requirements • Cleanliness
DE – L	<ul style="list-style-type: none"> • Storage capacity
DE – N	<ul style="list-style-type: none"> • Storage capacity and utilisation • Technical requirements • Cleanliness • Visual inspection • Connections, seals • Resistance to corrosion • Proper operation of the installation • Overfill monitoring • Emission control requirements • Preventing risks of leakage • Absence of manure in drainage hole • Ammonia emissions (manure coverage) • Records • Quality of construction • Coverage of stores • Installation management
DE – SC	<ul style="list-style-type: none"> • Proper operation of the installation
DE – ST	<ul style="list-style-type: none"> • Emission control requirements
DK – V	<ul style="list-style-type: none"> • Preventing risks of leakage • Ammonia emissions (manure coverage) • Records • Nitrate loss of groundwater • Nitrate and phosphate loss to surface waters
EE	<ul style="list-style-type: none"> • Whole complex including manure store – visual inspection • Storage capacity (must be 8 months) • Store and gutters leak-proof
FR	<ul style="list-style-type: none"> • Leakage • Absence of manure in drainage hole
HU	<ul style="list-style-type: none"> • Existence of manure storage • Capacity • Resistance to corrosion • Sealing
IE	<ul style="list-style-type: none"> • Visual inspection of defects • Manure level in slurry tanks • Records

	<ul style="list-style-type: none"> • Collection systems – channels and surface water from dirty yards
LV	<ul style="list-style-type: none"> • Visual control • Quality of construction • Coverage of stores • Installation management • Record keeping
NL - F	<ul style="list-style-type: none"> • Overall construction • Bottom safety • Good housekeeping
NL - G	<ul style="list-style-type: none"> • Manure storage activities • Odour issues
PL	<ul style="list-style-type: none"> • Amount and kind of manure produced and its registration • Methods to remove manure from pig unit to slurry store • Stores (slurry tanks, manure pads, lagoons): volume, level, sufficiency, tightness, covers, frequency of emptying • Analysis of soils • Analysis of liquid manure for nutrients
PT	<ul style="list-style-type: none"> • Manure stores and waste water treatment lagoons focus of inspection • Leakage points
RO	<ul style="list-style-type: none"> • Verification of test reports to ensure stores work properly
SE	<ul style="list-style-type: none"> • Coverage of manure store – type and capability to tackle odour and ammonia • If leakage – effects on water or other sensitive areas • Size of manure store – sufficient for 10 months storage
SK	<ul style="list-style-type: none"> • Technical conditions and sealing • Sufficient capacity • Overfill monitoring • Underground storage monitoring • Manure handling system
SI	<ul style="list-style-type: none"> • Visual control • Emptying stores to check for corrosion/leakage
UK- EW	<ul style="list-style-type: none"> • Visual inspections • Currently all farms with improvement condition to replace or cover slurry stores and to submit proposals for impermeable base and effluent containment for solid manure stores. • Stores to hold 16 weeks manure and be maintenance free for 20 years
UK- NI	<ul style="list-style-type: none"> • Coverage of stores • Emissions from stores (ammonia, odour, visual evidence of leakage)
UK- SC	<ul style="list-style-type: none"> • Visual inspections • Operation and maintenance of any stores likely to cause pollution

Some respondents indicate the most likely issues that cause non-compliance with permit conditions. These include:

- Illegal manure storage – corrected following inspection (**Netherlands**, Gelderland)
- Lack of manure storage cover (**Denmark**, Vejle Kommune; **Sweden**)
- Lack/incompleteness of records (**Denmark**, Vejle Kommune)

- Leakage (**Estonia**, for old stores)
- Overfill monitoring is not functioning (**Slovakia**)
- No crust in manure storage (**Slovakia**)

In cases of non-compliance authorities report a number of potential responses. **Hungary** states that all non-compliance must be sanctioned. In contrast, others (e.g. **France**; **UK**, Scotland) can include a formal improvement notice before considering further sanctions. Otherwise non-compliance responses include the general range of administrative and criminal sanctions available for IPPC installations (fines, closure of installation, investigation, court action, etc) as appropriate and available in the different legal contexts of the Member States.

6.3 Inspections and manure spreading on land

Question asked:
Are inspections on manure spreading on land carried out? How? On which issues will the inspection focus, e.g. specific operational aspects, emissions or other impacts? In case of non-compliance, what are the main issues? What further actions will the authorities undertake to enforce compliance on this issue?

Conditions on manure spreading on land are usually not included within the scope of an IPPC permit, particularly if the manure/slurry is sent off site (which is often the case). For example, **Slovakia** states that inspection under IPPC is only possible if spreading occurs on land owned by the operator. A number of respondents, therefore, indicate that conditions relating to spreading are not included within inspection. However, most Member States have controls on manure spreading (if sometimes separate from IPPC) and some respondents indicate that such requirements may be subject to inspection/control. The following table lists those elements that are highlighted by respondents. These conditions generally include the need to comply with some form of manure management plan, with details concerning type and quantity of manure/slurry applied, area and timing of application as well as the need to protect the local environment, e.g. water courses.

Member State/ authority	Conditions inspected
CY	<ul style="list-style-type: none"> • Compliance with Waste Disposal Permit
CZ	<ul style="list-style-type: none"> • Compliance with manure application plan
DE – B	<ul style="list-style-type: none"> • Spreading to avoid nuisance with neighbours
DE – N	<ul style="list-style-type: none"> • Quantities of nutrients entering soils and waters • Technique of spreading is seldom checked • Records checking • Contents of nutrients in the manure produced • Quantity spread according to good agricultural practice
DK – V	<ul style="list-style-type: none"> • Verification of manure accounts
EE	<ul style="list-style-type: none"> • Technology used to spread slurry
FR	<ul style="list-style-type: none"> • Records checking • Complaints follow-up
LV	<ul style="list-style-type: none"> • Planning of manure spreading • Agreements with municipalities on time/date of spreading

	<ul style="list-style-type: none"> • Records on land used • Quantities applied • Visual inspection of water bodies
PL	<ul style="list-style-type: none"> • Contents of nutrients in the manure produced • Manure management practices • Land areas spread • Fertiliser plan compliance
PT	<ul style="list-style-type: none"> • Amounts and dates of manure spreading • Area spread • Records
RO	<ul style="list-style-type: none"> • Quantity spread according to good agricultural practice • Monitoring of soils and groundwaters
SI	<ul style="list-style-type: none"> • Compliance with manure management plans • Records of manure movements
SK	<ul style="list-style-type: none"> • Quantities spread • Season applied • How slurry was incorporated into soil
UK- NI	<ul style="list-style-type: none"> • Compliance with manure management plans • Records of manure movements

The main issues relating to non-compliance include:

- Application of manure at the incorrect time or weather (**Estonia; Romania**)
- Non-compliance with application plans (**Romania**)
- Application close to borders of water courses (**Denmark**, Vejle Kommune)

Non-compliance generally results in the issuance of a formal notice to comply in the future, as well as the potential for further action which can include fines and legal action, depending upon the legal context of the Member State. In particular, **Denmark** (Holbaek Kommune) notes that non-compliance can result in withholding a percentage of EC subsidies (if the farmer receives them). Compliance problems can also result in alteration of manure application plans or the development of compliance promotion activities (such as a local campaign regarding stream borders in **Denmark**, Vejle Kommune).

6.4 Inspection and animal housing

Question asked:
Are inspections on animal housing carried out? How? On which issues will the inspection focus, e.g. specific operational aspects, emissions or other impacts? In case of non-compliance, what are the main issues? What further actions will the authorities undertake to enforce compliance on this issue?

Inspections relating to animal houses vary across the Member States. For a number (see following table), the inspections are undertaken by environmental inspectors as part of IPPC implementation, although **Romania** notes that animal housing is not usually the focus of inspections and **Slovakia** indicates only limited scope of inspection. However, in some (e.g. **Germany, Poland, Portugal, Slovenia**) inspections are the responsibility of veterinary inspectors and, indeed, in **Portugal**

animal health considerations prevent environmental inspectors from entering the housing. **Hungary** reports that the environmental and veterinary inspectors undertake joint inspections.

The following table lists the aspects of animal housing that inspectors address. These include the general operational and structural aspects of housing, ventilation, measures to prevent emissions (sealing of floors, slurry movement, etc), management and record keeping.

Member State/ authority	Conditions inspected
CZ	<ul style="list-style-type: none"> Operational order
DE – B	<ul style="list-style-type: none"> Compliance with permit conditions, particularly TA-Luft
DE – N	<ul style="list-style-type: none"> Operational issues / management Compliance with permit conditions and GBR, particularly TA-Luft, waste conditions Animal welfare Ventilation system
DE – ST	<ul style="list-style-type: none"> Compliance with permit conditions, particularly waste conditions
DK- H	<ul style="list-style-type: none"> Operation Impacts Emissions
DK – V	<ul style="list-style-type: none"> Impacts on soils and waters from leaks
EE	<ul style="list-style-type: none"> General conditions Animal welfare
FR	<ul style="list-style-type: none"> Management of housing (manure, water, heating, ventilation, lights, cleaning). Water leaks
HU	<ul style="list-style-type: none"> Compliance with permit conditions
IE	<ul style="list-style-type: none"> Collection of slurry Integrity of tanks Separation of clean and dirty water
LV	<ul style="list-style-type: none"> Visual inspection of high-pressuring cleaning systems Climate control systems
NL - F	<ul style="list-style-type: none"> Number of pigs Ventilation and air in stable is acceptable Emissions from unit Bottom safety Water discharges Storage of dangerous goods Record keeping
RO	<ul style="list-style-type: none"> Periodic flushing of floors
SE	<ul style="list-style-type: none"> Compliance with permit conditions
SK	<ul style="list-style-type: none"> Heating and ventilation system operation
UK- EW	<ul style="list-style-type: none"> Management techniques to reduce fugitive and point source emissions Progress of current 12 month improvement plan and implementation of BAT
UK- NI	<ul style="list-style-type: none"> Compliance with permit conditions Permeability of floors/walkways and associated yard areas

UK- SC	<ul style="list-style-type: none"> • Compliance with permit conditions • Evidence of ongoing or likely pollution • Management • Maintenance • Record keeping
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Non-compliance can occur through various factors (although **Denmark**, Vejle Kommune, notes that non-compliance is uncommon), including:

- Pig numbers illegal high (enforcement in one case requiring pig numbers to be cut to two thirds of numbers present) (**Netherlands**, Gelderland)
- Poor operation of the housing (**Germany**, Neubrandenburg)
- Removal of slurry (**Germany**, Neubrandenburg)
- Non-compliance with plans (**UK**, England and Wales)
- Insufficient funds for improvements (**UK**, England and Wales)
- Unclear what is BAT for different housing designs (**UK**, England and Wales)

Non-compliance generally results in the issuance of a formal notice to comply in the future, as well as the potential for further action which can include fines and legal action, depending upon the legal context of the Member State.

6.5 Inspection and air abatement techniques

Question asked:
Are inspections on air abatement techniques carried out? How? On which issues will the inspection focus, e.g. specific operational aspects, emissions or other impacts? In case of non-compliance, what are the main issues? What further actions will the authorities undertake to enforce compliance on this issue?

A number of authorities indicate that inspections are not undertaken for air abatement techniques (**Denmark**; **Ireland** (but see table); **Portugal** (but see table); **Sweden**; **UK**, Northern Ireland). However, it should be noted the earlier comment concerning the understanding of ‘technique’. **UK** (England and Wales) notes that detailed studies are underway to examine the extent of ammonia impacts on the surrounding environment to assist in determining what air abatement controls are needed and what aspects require inspection.

The following table lists the aspects of air abatement techniques that inspectors address. These generally include the correct state and functioning of any abatement equipment, ventilation and aspects of ambient environmental monitoring, such as odour nuisance, both to identify issues and check on the efficiency of abatement equipment.

Member State/ authority	Conditions inspected
CY	<ul style="list-style-type: none"> • Compliance with permit conditions
CZ	<ul style="list-style-type: none"> • Control of ammonia emissions
DE – B	<ul style="list-style-type: none"> • Odour nuisance information

DE – L	<ul style="list-style-type: none"> • State and functioning of equipment
DE – N	<ul style="list-style-type: none"> • Compliance with permit conditions • State and functioning of equipment • Records of operation of equipment – cleaning, maintenance, etc
DE – ST	<ul style="list-style-type: none"> • General surveillance
EE	<ul style="list-style-type: none"> • Compliance with permit conditions
HU	<ul style="list-style-type: none"> • Existence and state of equipment • Emissions • Good housekeeping • Records
IE	<ul style="list-style-type: none"> • Odour nuisance around installation noted
LV	<ul style="list-style-type: none"> • Visual inspection of ventilation systems • Records of ventilation system maintenance
NL – F	<ul style="list-style-type: none"> • Operational use • Measurements of input and output of abatement systems by a certified company • Safe use of dangerous acids • Storage of water used in abatement system
PL	<ul style="list-style-type: none"> • Sources of point and fugitive emissions • Equipment state, sufficiency, etc • Accuracy of measurements • Environmental fees
PT	<ul style="list-style-type: none"> • Lagoon conditions (only)
RO	<ul style="list-style-type: none"> • Verification of air monitoring
SK	<ul style="list-style-type: none"> • Compliance with permit conditions, only if they are in the permit
SI	<ul style="list-style-type: none"> • Compliance with permit conditions
UK- EW	<ul style="list-style-type: none"> • Currently under development
UK- NI	<ul style="list-style-type: none"> • Theoretically would focus on maintenance and operational control • Monitoring to assess abatement effectiveness
UK- SC	<ul style="list-style-type: none"> • Theoretically aspects of operation most likely to impact on environment

There can be problems in ensuring assessments of compliance. For example, **Germany** (LMS) noted that neighbours can have problems distinguishing between odour problems arising from slurry and those from air cleaning equipment. **Poland** notes that operators initially had difficulty finding accredited laboratories to carry out the required analysis.

Respondents identified few specific compliance problems, other than general problems arising from slurry pumping and spreading (**Slovakia**). Indeed **Poland** and the **UK** (England and Wales) both state that cases of non-compliance on this issue have not been detected. Few respondents indicate procedures to be taken when non-compliance occurs, except to note that they are the same as those indicated for non-compliance for the issues described earlier.

6.6 Inspection and odour

Question asked:
Are inspections on odour carried out? How? On which issues will the inspection focus, e.g. specific operational aspects, emissions or other impacts? In case of non-compliance, what are the main issues? What further actions will the authorities undertake to enforce compliance on this issue?

Most Member States report that inspection activity will focus on odour emissions if complaints arise. Otherwise odour control is a part of the general inspection relating to housing and manure management. However, **Poland** notes that odour emission inspection is not part of the regulatory framework and the **Czech Republic** notes that investigation procedures relating to odour are under preparation.

Inspections can focus on various aspects of the installation that can give rise of odour –housing systems and manure storage. However, odour problems can be worse with manure spreading (**Sweden**). Inspection activity where there are complaints will focus on results of odour emissions monitoring and assessment and measurement or calculation of odour in the environment to compare with the complaints that have arisen.

Member State/ authority	Conditions inspected
CY	<ul style="list-style-type: none"> • Check on permit conditions
DE – B	<ul style="list-style-type: none"> • Management • Compliance with general plant capacities • Exhaust gas cleaning
DE – L	<ul style="list-style-type: none"> • Assessment of odour in the environment
DE – N	<ul style="list-style-type: none"> • Check on permit condition • Compliance with general plant capacities • Implementation of an odours protocol • Assessment of odour in the environment – measurements, climate effects, etc, complaints. • Assessment by olfactometry
DE – ST	<ul style="list-style-type: none"> • Implementation of an odours protocol • Measurements of odour emissions • Calculation of odour in the environment
DK- H	<ul style="list-style-type: none"> • Investigation if complaints occur
DK – V	<ul style="list-style-type: none"> • Investigation if complaints occur focusing on: <ul style="list-style-type: none"> ○ Housing systems ○ Manure storage ○ Other sources
EE	<ul style="list-style-type: none"> • Compliance with permit conditions
HU	<ul style="list-style-type: none"> • Assessment by olfactometry • Existence of storage facility – its capacity, operation • State of buildings, doors, windows, ventilation • Good housing • Handling of animal carcasses
IE	<ul style="list-style-type: none"> • Investigation of odour nuisance

LV	<ul style="list-style-type: none"> • Implementation of odour reduction and prevention measures
PT	<ul style="list-style-type: none"> • Lagoon conditions • Manure spreading
RO	<ul style="list-style-type: none"> • Verification of monitoring • Techniques for spreading and handling of manure • Implementation of permit conditions
SE	<ul style="list-style-type: none"> • Most complaints arise from manure spreading (rarely housing), so this is checked
SK	<ul style="list-style-type: none"> • Compliance with permit conditions, only if they are in the permit (usually not)
SI	<ul style="list-style-type: none"> • Check on building/use permit by building inspectors, manure/slurry storage by agriculture inspectors
UK- EW	<ul style="list-style-type: none"> • Implementation of permit conditions • Focus on management techniques for removal of slurry and manure
UK- NI	<ul style="list-style-type: none"> • Subjective assessments, e.g. at site boundary, especially if history of complaints
UK- SC	<ul style="list-style-type: none"> • Strength of emissions • If problems persist, all aspects of operation to be investigated

Few problems are noted concerning compliance, other than that complaints do arise. **Sweden** and **Germany** (Neubrandenburg) note that there can be problems correlating measurement results with the complaints that do arise. Consequences of non-compliance were noted by few respondents, but are similar to those noted for earlier cases of non-compliance.

7. OTHER ISSUES

Question asked:
Are there any other issues that you would like to raise with regard to the practical application of IPPC to pig farms?

The following other issues were raised by respondents with regard to the practical application of IPPC to pig farms:

- How an operator can prove an installation is below the capacity limit for inclusion under IPPC (**Slovenia**)
- There are problems defining permit conditions based solely on BAT techniques set out by BREFs as BREFs do not have legal status in Slovenia (**Slovenia**)
- BREFs not translated to national language (problem for permit writers, inspectors and operators) (**Slovenia**)
- Differences between Member States – in Slovenia for getting permit (also for existing installations) installations must be totally in compliance with national legislation and no extension period for some non-compliances in permit is possible. (**Slovenia**)
- There is no BAT AEL for the intensive livestock farming in the BREF, which is different to other sectors. This makes regulatory activity more difficult (**France**).

- Is slurry storage under slats acceptable? (**UK**, Scotland)
- What is the most appropriate solution to control waste water from manure stores? (**Estonia**)
- Housing identified in the BREF is claimed to not be consistent with welfare requirements (**Ireland**)
- A training programme for farm employees can be required in the permitting process (**Czech Republic**)
- Land-spreading by contractors (**Slovenia**)
- Traffic impacts for slurry transport, especially in Spring (**German**, Schwerin)
- Upgrading of slurry storage is slow as it only happens at replacement (e.g. every 20 years) (**Ireland**)
- Problems of investment when economic conditions are poor (**Ireland**)
- Requirements for inspection not prescribed in the Directive (**Slovenia**)
- Alternative utilisation of manures (e.g. slurry separation/treatment) (**UK**, Northern Ireland)
- Impacts of ammonia on sensitive habitats (**UK**, Northern Ireland), including how to use critical loads, etc (**Germany**, Neubrandenburg)
- Difficulties linking odour measurements and assessment to actual complaints (**Germany**, Neubrandenburg)
- Impacts of slurry on soil conductivity (**Cyprus**, MANRE)
- How to monitor nutrient requirements in animal feed (**Germany**, Stralsund)
- Insufficient knowledge on impacts and transfer of veterinary medicines, detergents, disinfectants, etc. (**Germany**, LMS)
- How should vermin be addressed and are they a ‘fugitive emission’? (**UK**, England and Wales)
- Currently permits do not set conditions for water use or animal feed (regulated by another authority) and integration of this would be beneficial for ammonia control (**Netherlands**, Flevoland)

Annex 4: Summary of the Project Inspections to Pig Farms and Regulatory Authorities in Italy, Latvia and Germany

Inspection in Italy

Meeting 1 and 2 April 2009 Modena, Italy

Participants

Vincent Nicolazo de Barmon from France, Janneke van Wigcheren from the Netherlands, Tiago Tsameiro from Portugal, Judite Dipane from Latvia, Fausto Prandino of the province of Modena, Maurizio Zironi of Arpa Modena, Valentino Biagioni from the province of Modena.

General

Permitting situation

In Modena there are 32 IPPC pig farms and 300,000 pigs in all the pig farms altogether. All of them have a permit. In Italy there is a big difference in the level of the way farms are developed and the permits they have. The Province of Modena is the top level. Fausto mentioned the Region Campania (Naples) as one of the lowest. In that region, and in some others, there are farms without permits and there is no knowledge of how the farms are undertaking their activities. There is also probably no inspection.

Inspections

Inspection can have the effect that the middle level or lower do reach a high level. There is one farm in Modena which is certified.

Permit process

There is public discussion before issuing a permit. An application is publicised in a newspaper. Before the application for a permit is given to the authorities there is a meeting with the institution that coordinates the permit process, the local administration for the buildings, and the local administration for the manure spreading, Arpa, office of Fausto and the farmer. The institution that coordinates the permit process receives the application for a permit. They consider the application. The Province of Modena issues the permits under IPPC. It takes 5 months to issue a permit. There is an intention for publishing the IPPC permits on the internet, but for the moment it is not yet possible. Fausto showed us a schedule of the permitting process.

Permit content

A permit in the Province of Modena has a monitoring and reporting plan. That is rare in the country. The permits contain a checklist for the inspector. Since 1995 the Province issued permits. Since then the farms have developed and the farmers have received revised permits for longer times. Since 2008 the permit contains an animal plan and the farmers make a report every year.

(In Latvia there is a common format of permit for IPPC installations including pig farming. There are only state permits. It is the task of Judite Dipane to get every

permit on the same level. Latvia started to give permits from 2002 with a validity for five years; now they give revised permits for a longer period of validity).

The farmers must do at least one BAT in each part of the aspect in the permits (house keeping, manure storing, manure spreading and odour reducing).

Environmental situation in Modena Province

In the Province of Modena there is a lot of concern about the manure spreading, because the drinking water for the people in Modena comes from the mountains in the south. In Castelvetro is ceramic industry, there are a lot of farms and there live many people. The Province has the responsibility for drinking water. There are a lot of sources in the south of Modena. The Province takes, several times a year, samples of the water. Arpa makes the analyses of the soil water. With the numbers they obtain the Province has made a map of the levels of nitrate in the soil water. It is acceptable at 50 mg/l. There are places in the vulnerable zone that reach 90 or more mg/l. Since they make more efforts to diminish the levels they have good results (2003 and 2004). New farmers sometimes have to make analyses of the soil before gaining a permit.

Manure is collected in two parts. Coming from the alleys it is pumped up (ca 3 meter) to a kind of a filter. The dry part falls down and the liquid is transported via a pipeline to the first lagoon. There are seven lagoons that are serially connected. In the lagoons the liquid is naturally purified over six months. The liquid of the last lagoon is used for the removal of manure out of the alleys. The dry part is used for manure spreading on agricultural lands, but also for biogas production. In Portugal that system is also used.

(In France the permit issuers are also inspectors).

We did not talk about the application.

Manure storage

Permit conditions:

- As mentioned above the permits contain a monitoring and reporting plan. There are no conditions like that in the Dutch or the Latvian permits.
- The manure must be transported quickly out of the external alleys to avoid problems with ammonia or odour.

Inspection:

- The inspector can follow the checklist. He knows that the manure must be removed quickly (at least every day) from the alleys.

Manure spreading

Permit conditions:

- Monitoring and reporting is part of the permit conditions.
- Spreading is an issue in the permit: which techniques and quantity; they have to analyse the soil, animal plan of manure. Big farmers do not have their own soil on which to spread. They ask permission to spread on other fields. If it is

more than 5 km away from the farm then they must report to the office. Transport must have a registration. The dry and the liquid part are both used for fertilising the soil.

- Spreading is limited to 6 bar, because of the odours and the ammonia.

Inspection:

- The farmer sends a report to the province of Modena with the places, the amounts, the period and the way of spreading. It is not possible to inspect all spreading activities. In the vulnerable zone farmers must do everything that is possible to keep the groundwater on an acceptable drinking quality level. They know the importance of what they are doing with the spreading. The Province has given financial support for the transport of manure out of the vulnerable zone.

At the time of the visit the lagoons give no problems with odour. It is possible that when the temperature gets higher there is an increase of odour. In Portugal is that known as a problem.

Housekeeping systems

Pigs can go out of the building to the alleys. The manure of the external alleys must be washed away quickly. Inside the pigs rarely defecate. So inside there is an acceptable living condition for everyone. Abatement systems are not needed. The flat floor is made of concrete and has no grid. Nothing is on it. The pigs can play a little with empty cans that hang from the ceiling.

Permits conditions:

- The building must have BAT. If not then the economy is leading the solutions. In Latvia there are abatement systems too. In Portugal there are no alleys and no abatement systems in the permits, but the permit maker knows that in a short period of time the abatement systems must be included also.

Monitoring and reporting:

- There is no need for monitoring and reporting.

Inspection:

- The inspector checks the permit with reality.

Air abatement systems

In this farm is no abatement system. It is not an important issue in Italy because of the alley system. In Portugal there are no abatement systems. In Latvia they have ventilation systems, the use of specific filters to reduce odour will start to be implemented, but we did not talk a lot about it. In the BREF the abatement systems are not mentioned, but it is a good practice in agriculture to decrease the odours.

There is a new law for monitoring ammonia in Italy, and there is software to calculate ammonia and methane emissions (V-stacks in Holland). That can help for the permitting decision. In Italy there is no concern about PM10, not in the permit, as well in the minds of the permit makers. In Holland it is an important issue.

Permits conditions:

- There are no conditions in the Modena permit

Inspection:

- Housing systems and abatement systems are linked. Abatement systems are not used so the Province of Modena does not inspect the emissions, only housing systems.

Odour

Odour is no problem in Modena, except during the spreading on the ground.

Permits conditions:

- There are only ammonia and methane conditions in the permit (part of the monitoring and reporting plan).

Monitoring and reporting:

- The farmer makes a report of ammonia and methane emissions. The emissions are calculated, not measured.

Inspection

- The inspection is only on paper.

We saw an animal report of the farm in Castelvetro. This year it was the first time the province of Modena received an animal report. The purpose is to know the costs of production animals and maintain the soil. Key points from the animal report are@

- Food is 3297 ton serum²;
- 20 male pigs;
- 1030 sows;
- 2500 finishers (over 100 kg);
- 2000 growers (until 70 kg);
- 1240 weaners (young ones, taken away from the mother).

- Emissions of ammonia 38.9 ton and methane 101.6 ton
- Consumption of water 15,715 m³
- 55 ton organic waste
- Lagoons are in good situation. In 2007 registration is signed. It must be done every 10 years.
- Spread manure in 2008 on 1,470 acre of soil. 210,6711 ha in vulnerable zone and 60,8077 ha in ordinary zone.
- Maize and wheat are grown, they put 5,100 dry manure on that soil, and 20,500 m³ liquid manure.
- 43,500 kg ammonia spread (capacity of the soils bigger)
- Efficiency 0,48% used N (that is sufficient)
- Analyses are not yet given.

² Serum comes from the milk when fat and protein is removed

- Energy used: petrol 6,500 litre, 18691 m³ methane, electricity 435,138 kwh.
- Disinfectors: given in money, that is not asked. The province shall ask for the right numbers.
- Veterinary waste 92 kg

Water that is extracted from the soil is free until 30 m. If deeper, then a permit is needed. These are regional permits. The Province of Modena wants to know the quantity of extraction in order to save drinking water. There are no numbers yet.

Spreading manure:

- Date, location, area, mobile container, quantity is given.

Waste report:

- At one day there was put in the frigid 30 kg waste with classification 18.02.02* (dead animals, Euralcode in Holland)

The visit of the farm.

It was not an inspection.

First we visited the farm that is open for the public. In this farm they only do breeding. We could see the animals through glass windows. In this farm there was an experiment to have five sows with their piglets in one room (at the time of the visit there were only three together, because of some problems). The workers of the farm know the character of the animals and they make a choice of which sows can live together. The small ones can be in an area that is warmed by warm water pipes (28°C), the room is 20°C. The floor is with a grid and made of a kind of plastic. There is 6 m² per sow. It looks very comfortable for the animals. 11 days after the birth they are brought here.

When the small ones are big enough they leave the mother and go to another farm. In this experiment there is only 1% outfall, normally it is 5%. The small ones grow up more quickly.

They told us, we did not see, that they did an experiment with milking the sows. The obtained milk is distributed among the young ones. The purpose of it is to be sure that all the piglets get enough milk.

Outside there is no odour. The farm has a big solar panel.

The second visit was to a farm in Castelvetro with the same owner. He has a manager who is responsible for this farm. The owner has a lot of farms all over the country.

Outside we saw the block where some of the male pigs live (7). They have very little room, which the possibility to go inside. No odour.

In front of the building there is a lot of white powder (disinfectants) to keep rats outside.

We visited the delivery room first. Here the sows are laying under iron fences to avoid walking over the young ones. Five days before delivery they come here. Sometimes they get more young than they can cope with, so the piglets are spread to other mothers. The floor on which the animal is lying is the same as in the first farm we visited. Under there is a ceramic floor that is in the middle lower than at the outside. So the urine is flowing quickly. The manure goes slowly. After the sows leave, the place is cleaned. There is a temperature of 20°C; for the young ones there is a place that is 28°C. The air comes through the windows that can be closed if necessarily. A computer controls the quality of air and the temperature. Inside there is not much odour, outside we do not smell odour.

After five weeks the small ones are separated from the mother.

The second group is that of the weaners (5 weeks until 20 weeks).

Here there are 50 animals in a group. There are 7 groups. There is a concrete flat floor with an opening in the outside wall. The animals do not defecate inside. The floor is clean. They go outside (alley) to defecate. The alleys must be cleaned every day. To do that there is a big container that slowly is filled with water from the last lagoon. When it is full enough it turns upside down. When it is empty it turns right up. Inside and outside there is no odour.

When the animals are 20 weeks (60-70 kg) they leave this part of the farm. The living place is cleaned very well and stays empty for one week.

Fausto told us that a lot of farmers changed management. They have now more care about health and welfare.

Dead bodies are collected into a fridge. They go to a facility that makes biogas from organic waste (not allowed in Holland).

Manure is also transported by a cooperative to bring it where it is needed, out of the vulnerable area.

The food for the weaners is dry. That of the bigger ones is wet food. A computer calculates what they need every day. It is food produced for the animals, not waste of the human food production (as in Holland is often used). There is a mixing place where the food is prepared, for each group another receipt, and depending of the age.

Lastly we visited the manure storage place. The manure is transported from the alleys to the collecting place. There it is pumped up to the separator. It is a turning roll with a filter to separate water and dry material. The water is not pressed out, so the dry material is still a little bit wet. The water goes via a pipeline to the first lagoon. The dry material can be used as manure on the field or as base for biogas.

Over all it seems to me the farmer is doing well. It has not the high level (building and farming place outside) as we are used to in Holland.

I asked the members of the group what was the greatest impression on them and what they learned.

Janneke's impression

On the farm were the alleys and the cleaning of it a big surprise. There was no odour problem inside or outside. The separating of the manure was not new for me. I saw it once in Holland, but that farmer made a lot of effort to clean up the water so that he can sell it as fertiliser.

The situation in Italy is not possible in Holland. The laws are there, and they are for IPPC the same as in the rest of Europe. But the political situation can do a lot with the behaviour of the authorities. So there are regions where IPPC farms have no permit.

The permit of the farm in Castelvetro had only two pages. The rest was an animal plan and a monitoring and report plan. Further it contained a checklist for the inspector. There are no conditions for protection of the soil of the farm site, no conditions for emissions, no conditions for noise or dust emissions. The only concern they have is the drinking water they have to protect. In the permit there are big spreadsheets that handle manure spreading.

Tiago's impression

Tiago said that he was surprised about the way of relationship between other regions. It seems to be a competition. Modena is the best. There is a lot of political influence, so the politicians decide how the rules are allocated, not the laws.

He thinks that a permit must contain conditions that an inspector can help to do his job. There are a lot of laws that are changing. How can farmers know all the rules? So the permit must be clear.

He wanted to see the carcasses disposal system and the technician report about the lagoons' impermeable layer. In his opinion that are good ways to resolve the usual problems in Portugal. We saw the carcasses disposal (coolant R 134A), but not yet the technician report.

Judite's impression

I saw big difference between current situation in Italy and Latvia. The fact, that there are no permits for some IPPC installations in Italy was a surprise.

For me the permitting procedure looks very complicated. I also did not see an evaluation of the impact of installation before or during permitting based on environmental aspects.

As far as I understood the permit contains very technical specification for manure spreading (including soils map etc.) but there are no conditions regarding other environmental aspects such as use of resources (water supply, raw materials - chemicals etc.), protection of air, waste water, waste management.

It was great to see a good relationship and high level cooperation among operator, permit issuing institution and inspections.

In Latvia animal welfare is not the competence of environmental institutions as well as calculation of possible rates for manure spreading on the fields.

Vincent's impression

I like a lot Fausto's philosophy :

- The permit has to be as short as possible;
- The farmer has to respect the inspection job, the inspectors have to respect the farmers job;
- The reality is out of the window.

I noticed different aims of the implementation of the IPPC Directive: every one at the same level, improve the average situation (emission reduction of 10 % in Modena province), adaptation to the environmental and economic situation (nitrogen in groundwater for Modena area and no investment for the moment, but focus on management and formation).

My main concern is the estimation of the achieved environmental benefits by the IPPC farms. We have a list of BAT, but no corresponding emission level.

Inspection in Latvia

Joint inspection Latvia 23 and 24 April 2009

Participants

Participants from Latvia State Environmental Service: Judite Dipane (expert), Villis Avotins (general director), Elmars Jasinskis (inspector of visited pig farm), Gunta Abramenkova (expert), Imants Krumins (expert), Sandra Fridihsonsone (expert), Zinta Lace (expert).

Participants from abroad: Fausto Prandino (Italy, Province of Modena), Kerstin Elberskirch (Germany), Manuela Florean (Romania), John Visbeen (Province of Utrecht, Netherlands), Margrethe Bongers (SenterNovem - InfoMil, Netherlands)

Visited farm

We visited the pig farm LTD Ulbroka.

State Environmental Service of Latvia

Judite presented the activities of the State Environmental Service: nature protection, natural resources, chemicals management, waste management, prevention and control of pollution.

There are two types of permit or license:

- Single permit/licence. This type is valid for 3 or 5 years. It covers one issue, e.g. natural resources or air or water.
- Integrated permit. This type is valid for 5 years up to 8 years. It covers all environmental issues like air, soil etc.

In future the permits may become unlimited with a five-yearly revision.

Prevention and control of pollution

There are three categories of installations:

- Category A: IPPC installations, conditions include BAT requirements;
- Category B: conditions include cleaner production principles;
- Category C: general rules, registration of small size polluting activities.

Plans for future developments are:

- Quality management of own agency;
- Development of electronic services: e.g. encourage electronic permit application and reporting;
- Implementation and use of electronic signature.

IPPC installations

In Latvia there are 84 IPPC installations of which about 20 are pig farms, 6 are poultry farms and about 30 are large combustion plants.

The average size of a pig farm is about 16,000 pigs, so there are about ~300,000 in all the pig farms together. All of them have a permit.

Permitting procedure

In Latvia the time frame for issuing a permit is 3 months. In Italy this is 5 months, in Romania and The Netherlands 6 months, in Germany for IPPC installations 7 months. In all countries it is hard to get it done within that time frame, whether it is 3 or 7 months.

In Latvia the State Environmental Service is the competent authority in the field of issuing environmental permits. Permits are issued at the regional structure units (regional environmental boards) of the State Environmental Service. They all follow the same procedures.

The full application is published on the Service's website for 40 days. Within 30 days after publishing the public and other authorities can give comments, the comments will usually be directed to the Agency, the Agency will forward the comments to the farm operator and ask for a reaction.

About one month after publishing the application, before permitting, there is a public hearing on the application. These are usually not really big meetings, in general the public is not very active.

The director signs the permit. The decision on whether or not to grant the permit is published on the website, including the application and the relevant conditions of the permit. What is relevant, this is described in a law.

All appeals about a permit go to an ombudsman. If with the ombudsman's help no agreement is reached, the applicants can go to court.

When an activity is stopped, the site should be left in same state as it was before the activity.

In The Netherlands the application is first published together with the draft permit. During six months the public can comment, if relevant a public hearing is organized. After this period for commenting, the final permit is written. In Germany the procedure is similar. Note by Kerstin: she just received 700 letters from the public in a permitting procedure for a 10,000 pigs farm.

In Italy one person is in charge of the whole procedure. Letters from stakeholders are sent to the farm with a request for comments. To come to an agreement with the farm, Fausto finds it necessary to know the farmer and the farm.

In Latvia and The Netherlands applicants do not pay for a permit. In Germany, Romania and Italy the applicants do pay for a permit. In Italy a permit will cost up to € 40,000 for the big industries, for the pig farmers a permit costs between € 1,000 and 1,500.

In Germany the costs of a permit depend on the total costs of the project (planning and building the farm). For example: for a farm with total investment costs of about € 15.5 million, the costs for the permit would be about € 70,000. This is only what the authority gets for her work in connection with the permit!(not for expertises etc). Furthermore the applicant has to pay all the costs in connection with public hearing etc.

In all countries, the applicants usually hire a consultant to take care of the application.

Some political influence on the permitting process is a reality in all countries.

Inspection

The frequency of inspection depends on the installation:

- Category A: 2 – 3 times per year
- Category B: 1 - 2 times a year
- Category C: once every 2 – 4 years.

The number of inspectors per inspection depends on the sort of industry. Usually just one inspector goes; for complex and higher risk situations two or three people will go. E.g. for SEVESO II-objects, about five people from different specialties inspect together, the environmental agency coordinates.

Latvia uses a standard form for an inspection report, see annex B. The form should be signed by the operator, to confirm the observations by the inspector and prevent the operator from saying the observations are not true. There are planned and unplanned inspections, for both the same standard inspection form is used. The State Environmental Service is considering integrating the inspection report and the report for communication with the community.

The current number of animals should be reported in an inspection report. Environmental inspectors are normally not allowed to go inside the houses. Therefore they get information on numbers of animals from other authorities.

The size of a sanction depends on the violation, not on how big the business is. There is a range though: from 70 to 7,042 Ls (€ 1,000 to € 10,000) plus costs of damage to the environment (this includes costs of measurements, cleaning, etc.).

In case the police, during their routine work, observe an environmental offence, they inform the State Environmental Service. This is a routine procedure in Latvia for some fixed situations, e.g. illegal waste dumping. In such cases exchange of information and reports with the police is possible. In pig farming cooperation with the police is not relevant.

In Italy the operators not only pay for the permit but also for the inspection. The philosophy behind this is that IPPC is an agreement between operator and competent authority. Who pollutes, has to pay; that includes paying for the inspection. A farm is inspected about once every two years. The regional inspection team decides when to inspect.

The operator has to pay before 31 January. Sometimes payment is a problem. During the year, the local inspector will organize the inspection. Costs depend upon the amount of pollution. For pig farms the costs are fixed, one inspection always costs €1,000.

In all countries it is obliged to report accidents immediately to the competent authority.

Latvia sanctions installations that are operated without a permit, it is not a special case but one of the possible violations.

In The Netherlands operation of an installation without a permit is a special case. Depending on the history of the installation, the reasons why it is without a permit and the possibility to get a permit, it is possible to give a “gedoogbeschikking”: a temporary license to work without license. In Romania and Latvia this is not possible.

In Latvia prolongation of a permit is possible, e.g. when waiting for more information to the application for a new permit. It is the operator’s responsibility to ask for a prolongation if the application is submitted, but insufficient. The maximum duration of such a prolongation is two months.

In similar cases, Germany would give a “part permit” or a “permit to start in advance”.

Both Germany and The Netherlands have the possibility for the operator to make an “announcement” of changes that have no negative environmental effect. In the other countries there is no such option.

Natural resources tax

In Latvia operators pay taxes for the use of natural resources. This includes water use, emission release to the environment (air, water, waste management). The fee starts from 50 Ls (about € 70) per year for category C installations; for bigger industries, the costs are higher and calculated individually.

Pig farms pay for use of ground water, emissions from the combustion plant, emissions of ammonia, etc. In Latvia pig farmers do not have to pay for odour emissions, except or probably for the case when concrete chemicals are detected. Therefore, the operator has to provide information on emissions of ammonia, usually four times a year (the frequency can differ from one permit to another). A certified laboratory should analyse the ammonia samples.

It is a duty of the regional inspection to check and confirm the amount of taxes (taxes are collected by State Revenue Service).

Natural Resources Tax (pig farm inspected during site visit):

2006 - ~1020 EUR

2007 ~ 1090 EUR

2008 ~ 1040 EUR

Manure storage

For manure storage, criteria are set per individual farm. The storage volume should be enough for 6 or 7 months; this is because of the rules for manure spreading. Covering manure is dealt with in the BREF and therefore only needed for IPPC installations.

Manure may be stored on the field for a maximum of 12 months (or 18 in a non-vulnerable zone), but always in a specially equipped place. Such temporary storage is only allowed after a minimum stay of 3 months in manure storage.

Also in Italy, temporary storage of manure is only allowed after a 3 month stay in a storage tank. Storage of solid manure on the border of a land is allowed no longer than 3 months. Manure should be stored at a certain distance from water borders, not on a hill. A small canal should be dug around it, a cover is only needed for poultry manure.

Manure spreading

Latvia has national legislation for manure spreading; it is an implementation of the EU nitrates Directive and regards all types of manure, also cattle. It is the same for all installations, IPPC and others. The maximum is 170 kg N/ha/year as a total from chemical fertilizer and manure.

From 15 Nov till 15 March no manure spreading is allowed in nitrate vulnerable zones (3 of the 26 districts are vulnerable zones). It is also prohibited to spread manure when there is snow. Farmers always have to inform the local government beforehand when they want to spread. Limited roads can be used for the transport. Violation of those rules is seldom. Local people are very alert on this issue.

The amount of nitrate during manure spreading is controlled. Manure quality tests should be provided by the farmer. The competent authority then checks if the area is sufficient for spreading this amount of manure. Employees of the State Environmental Service generally are not agro-chemical engineers, so at this point there is a discrepancy between expertise and work. Inspectors also control the amount of manure removed and added (this is not automated). So inspection on manure spreading is a combination of paperwork and visual inspection of the installation.

The owner of the land also needs a ground water quality monitoring system (for manure storage).

The permit contains some criteria for manure spreading under “smells”. Amongst others quality measurements on the manure should be done before spreading. Poultry manure is smellier.

In Modena especially water pollution is a problem, therefore manure spreading is an issue.

Odour and ammonia

Latvia has a national regulation (not a law) for all industries with chapters about air quality, containing local wind and other conditions and the minimum distance to residential areas. Some maxima are derived from European Directives. Cabinet of Ministers Regulations No 626 adopted on July 27, 2004 „Regulation on the methods for determination of odor, as well order of limitation of odors from polluting activities” (established threshold levels of odour units, methods to detect)

For the application for a permit and also for natural resources taxes, the operator has to report the ammonia emissions in g/s and in $\mu\text{g}/\text{m}^3$. This is usually done by a consultant. For every application for a new permit (renewal after 5 years or relevant extension of farm) such a report is required.

To underpin the reported emissions, the applicant can use measurements or refer to literature data. Commonly used are the emissions from guidelines by the Australian or American EPA. From these emissions, the ammonia immission is calculated using dispersion modelling. A worst and a best case scenario should be calculated. Accepted models are EnviMan (Swedish) and ADMS (UK); other models can be used if accepted by the Agency beforehand. For initial assessment the ADMS screen programme can be used; this is not a dispersion model. Within the State Environmental Agency a central department of specialists on modelling checks the modelling and approves of it.

Only in the case of complaints, the operator should carry out odour measurements and present an odour reduction plan. This is the same for noise. Especially manure storage should be in the reduction plan; a measure can be to cover the manure storage. Odours are assessed per individual farm; there is not one solution or norm that applies for all farms.

Odour measurements should be done by an EN13725 accredited laboratory. Samples are taken at four points at the border of the plant, not necessarily downwind. Sometimes the regional board decides at which points to sample, sometimes the sample locations are decided by the laboratory. There is a standard procedure for sampling. The costs of measurements are relatively high.

In a practical example of such measurements, carried out for the farm we visited, the odour concentration was at all four points lower than the detection limit.

Romania requires twice a year an ammonia and dihydrogensulphide (H_2S) measurement. They use these data for estimating the odour emission.

John is interested in the relation between the odour emission and the feed. His perception was that there was not so much smell in the animal houses we visited in Latvia. In The Netherlands, the ammonia concentrations seem to be relatively high, both inspectors and pigs have red eyes.

Other business

Fausto plans to share the experiences from this IMPEL project with the (about 32) farmers in his region, the Province of Modena.

How to implement BAT in permit and inspection? And how to control that?

- Ministry asks for report on implementation of BAT.
- Permitting and inspection does not cover all details.

John mentions he is surprised by the very open discussion about the odour reduction plan between the farmer and the competent authority. In Romania such open discussions are also common. In Latvia the inspector also has the function of an advisor and to connect farmers to other farmers.

Russian expression: Bad peace is better than good war.

Impressions of the participants

Kerstin Elberskirch, Germany

My first impression of the farm was that it could have been even one old farm of the northeast of Germany (Mecklenburg-Vorpommern or Brandenburg). Even in this part of Germany there exist such large farms which were built before 1990.

The farmer in LTD Ulbroka was very open and friendly. He even spoke English very well so that we had a good conversation about the farm and even more. It was very interesting for me to see the reasons, ideas and plans of the farmer concerning abatement techniques.

In my opinion this farm was like a great hobby for the farmer. So he reconstructed the old buildings very well and inside the farm there was a very modern and clean installation. What was surprising for me was that he doesn't separate the families of the pigs. So he is sure that he can limit the fights among the pigs. He had no toys for the pigs inside the stable, which is one of the requirements of the authority of animal health in Germany.

Furthermore in Germany there is the requirement of windows at least in new stables (min. 3 % of the area of the stable). In Ulbroka there were no windows in the stable and only little artificial light (I don't know how many lux) and the farmer told me that the pigs like it to have it darker and that they grow well. I am sure that the pigs are growing very well there because they were very clean, without any fights and seemed to be as happy as such a pig in a stable can be. The loss is about 10-15% which is normal in comparison with German farms.

I just wondered about the little distance of the farm to the forest. The forest was directly beside the farm on two sides. In the Northeast of Germany old farms are situated near the forest, too. But today such a location for a farm is in Germany not possible because of the requirements concerning ammonia.

Regarding the permitting procedure it was most surprising for me that there are big differences between the EU-member-countries concerning the costs of a permit, of an

inspection and that Latvia has something like emission-taxes. Furthermore I was astonished that in some countries the permit has an expiration date. Regarding the permission procedure I wondered about the short time to get a permit in Latvia and about the difference to Germany concerning the public hearing. While in Germany there are quite a lot of protests especially concerning big pig farms, in Latvia the public seems to be not very active in this state.

Concerning inspection for me it was surprising that all countries, which took part in this inspection, have a quite narrow rhythm of inspection (e.g. one or two inspections per year). In Germany no general regulation for the frequency of inspections exists and so in Mecklenburg-Vorpommern the regional regulation is one visit per four years for IPPC pig farms.

Manuela Florean, Romania

The Riga joint visit was a good opportunity for me to find out how other countries manage their environmental problems. Latvian procedures in permits and inspections resemble very much the Romanian system; maybe our sanctions are a little bit bigger than in Latvia. Above all the work that we have done there, I had a great time with my colleagues from all participating countries.

Fausto Prandini, Italy

The inspection at Riga has been very interesting, particularly the human relationships.

I believe both very important the first contact with the Farmer: particularly to know his activity, his problems and his expectations.

To value the job of the people is useful to look for a common solution to the problems.

The public administration cannot remain to the window to look; we must be involved, we must be active in the search of the solutions to the problems.

Nothing more, nothing less, only joy.

The wise man says:

NEVER MIND WHAT YOU LEFT BEHIND;
KEEP IN MIND WHAT YOU ARE YET TO FIND

John Visbeen, The Netherlands

I was impressed by the good relation between inspector and farmer. The farmer was very well educated and always thinking about improving production, techniques, and ways of feeding.

The discussion at the end of the visit about new plans for a biofilter was a good example of how inspectorate and owner should discuss measurements, both at a same level, and both with the same goal; improving environment and preventing neighbourhood odour complaints. Of course the owner has also another economic goal, but there should be a balance.

I also noticed that the odour around the stables and in the stables was, of course to be recognised, but not so intense that I experienced in a stable in the Netherlands. In Latvia there was no biofilter or measurements like that, in the Netherlands there were. It was also at the inspection in Italy that Janneke van Wigcheren told me that, in comparison with some stables in the Netherlands with biofilters etc. the odour is less intense in the stables in Italy and around the farm. I'm wondering if the use of certain types of food, or another way of housekeeping (pigs go also outside the building from time to time) could be more important than biofilters.

I liked the discussion in the office of State environment about permit procedures and notice that there are differences. Here is where you can learn from each other the most and I think it's a good start-up for the workshop also. I'm interested in which country the period for giving a permit is the shortest. Latvia will be one of them I think. Also the discussion about environment taxes and paying for permits and even inspections is interesting.

The farmer told me that due to all rules, not only environmental but also animal healthcare, the production price for meat is rather high - so high that he has to export his meat to other countries and that most of the pig meat is imported to Latvia. A bit philosophical: I think this is beyond the limits of free market economy not only for Latvia but in general, because this means that a lot of transport takes place from and to a country. I know for instance that also lot of pigs are transported from the Netherlands to Italy. From a more integrated approach to environment we should think how to protect the environment by preventing unnecessary transport which is damaging the environment a lot.

Further on I want to say that I'm very proud of this project and the way countries are working together with each other, all at the same level, and enjoying listening to and to learn from each other.

Thanks to Fausto, Judite and Kerstin for organising these joint inspections!

Margrethe Bongers, The Netherlands

Inspection in Germany

Joint inspection Schwerin, 7 and 8 May 2009.



Participants

Vincent Nicolazo de Barmon from France, Frau Holzgraefe from Germany (only first day), Andrew Farmer from England, Kerstin Elberskirch from Germany, Joyce van Geenen from Holland and Fausto Prandino from Italy. The first and second day many German people joined us.

Permit

Permit conditions

In Germany it depends on the amount and kind of animals which authority has to give the permit. Germany has the government (Regierung) which is separated in 16 general states (Bundeslander) which are separated in provinces or administrative districts (Landkreise) and these are separated in municipalities (Gemeinden). From the 16 general states we got informed about two of them; Mecklenburg Vorpommern and Schleswig Holstein.

The large (IPPC) and middle-sized farms belong to the authority of the general states. Large (IPPC) farms are farms with:

- 40.000 places for poultry;
- 2.000 places for fattening pigs;

- 750 places for sows;
- 6.000 places for piglets;
- 1.0000 places for fur bearing animal.

In Mecklenburg Vorpommern 93 farms (60 farms with fattening pigs and 33 farms with sows) belong are IPPC farms, in Schleswig Holstein there are 15 (13 farms with fattening pigs and 2 farms with sows). All of the farms which are realised have a permit. The difference between the permit from a large farm or middle farm is the public involvement in the permit procedure and the time by which the permit has to be given. Because with IPPC farms there is the public involvement procedure (newspaper, internet etc) it takes 4 months more to issue the permit (7 months instead of 3 months).

A particular aspect of the permit-procedure in Germany is the using of the “one-desk” principle. The operator is asked to give all information about the building (including information for the fire-department), intervention landscape, sealing, manure spreading and damage to biotopes.

After the general states received this information they send it to the authority which can give a view about the plan and they send it back after this. The general states put all these views together in one integrated decision. The operator has to pay a fee to get his permit. The size of the fee depends on the investment the operator has to make to build or change the farm.

Permit monitoring and reporting

If a site is near an area with land use plans or close to houses-/a village and the operator can not make sure to get under the limit values of the regulations concerning odour or ammonia / nitrogen (GIRL, TA Luft), abatement techniques are asked in the permission.

For the permit the operator of the farm has to register the number of animals, measures of the abatement techniques, climate control, etc and other administration like the inspection of the manure storage.

Permit inspection

The inspection is organised through the general state at once in four years. At least one month before they contact other authorities to see if they want to join their inspection. Normally they go on inspection with 4-5 persons from different authorities. The general state does the inspection for the manure storage and emission control. This includes ventilation, climate, feeding systems and storage of food, abatement techniques.

The other authorities do inspections for:

- veterinary; housing systems, amount, health and welfare of animals (but they inspect oftener: 1-2 times per year)
- manure; manure spreading and manure transport
- water; water canals, groundwater and also manure storage especially concerning leakages
- building; place and construction of buildings, fire-conditions

Seen

We visited a farm in Fahrbinde. This was a former cattle farm. Now the operator has a permit to keep 4,634 sows including piglets (<30 kg) and a storage capacity for manure from 14,026 m³. The whole farm is connected to an air-washer with a biofilter.

(Inspection is free in Germany, France and Holland; in Italy the farm has to pay €1,000 for an inspection. Fausto says he's not happy because in some permits there's a condition that says there will be an inspection every two years and the Province and the operator signed the permit. That means now they have to keep themselves to this appointment and it costs more money for the farmer. In France, Germany and England permit authorities are also inspectors, in Italy and Holland they are not).

The farm uses food from different sources. There is corn, ccm and chunk but also products which are waste at other industrial companies like fish-protein, whey and potatoes. They mix the products before giving it to the animals. All animals get this mixed feed, though in different compositions.

The inspectors regularly use a checklist, Kerstin showed us. This checklist can vary between the different states.

Manure storage

Permit conditions

The conditions in the permit are nothing more than the regular rules. They say something about inspections, cleaning of the storage, how much the operator can fill it and how they have to fill it.

Monitoring and reporting

The information mentioned above has to be available for the inspector.

Inspection

The inspector can follow the checklist. It's allowed to store 14,026 m³ of manure at the farm.

Seen



Manure spreading

Permit conditions

Monitoring and reporting is not part of the permit conditions in the permit from the general state. Another authority does the inspections and asks the farmer, what his plans are. In Germany the farmer does not need a permit for manure spreading and not many farmers separate the manure into a dry and the liquid part.

In Germany it is only permitted to spread the manure from the 1 February until 1 November.

Monitoring and reporting

The farmer has to give information about the amount of manure he is producing, what the nutrients are, on which land he wants to spread it and which techniques he is using. The farmer of the land makes (afterwards) an annual report about what he did.

Inspection

The inspector checks the annual report and if there are questions about it, he's going to visit the farm. Sometimes he get's complaints about the manure spreading, and then he also goes on inspection. There is no visit for every farm, for example, every year.

Seen

We did not see the manure spreading.

Housing systems

Permit conditions

In Germany most housing systems are traditional. If they use abatement techniques, they are situated outside the stables.

There are rules about welfare like the use of toys, minimum size of space and also minimum of outside light (3% of the stable ground surface).

The farrowing sows are kept in individual places from which it's possible to open the back so the sows can stay in a group for a while.

Monitoring and reporting

There is no need for monitoring and reporting. Monitoring and reporting have been done by the authority responsible for veterinary housing systems, animal health and welfare. The state authority gets information if required.

Inspection

Inspecting the housing systems is not a job for the environmental inspector. In Germany the veterinary inspector is the authorised authority. The inspector checks the permit with the reality.

Seen

We didn't go into the stable.

Air abatement techniques

Permit conditions

If a farm is close to a village, housing areas or sensitive biotope, sometimes an air abatement technique is necessary. During the permit procedure the amount of odour and ammonia will be calculated and limited. In Germany there are different abatement techniques which are certified. At the moment a lot of farmers build the 3-step washer, also with a biofilter.

Monitoring and reporting

The operator has to do the monitoring and reporting for his abatement technique. The washer has to be visually inspected every week and the operation is constantly checked with a computer-programme. The operator keeps a registration of the washer and measures the pressure, water-use and the technical part.

He also has to prove how many hours the system is working and take measures about how it's working.

Inspection

The environmental inspector inspects everything that has to do with the emission control. When they visit the farm they do not go into the stable, they check the amount of animals, the working of the abatement technique and the manure storage.

Seen

The air-washer is 240 meter long, 2.7 meter high and consists of 10 separate modules which are in 1 row and attached to each other.

This air-washer is a two-step washer and reduces dust, ammonia and odour. Dust and ammonia are reduced in the first step; the odour is reduced in the second step. When the air comes out of the washer it's nearly free from dust and odour (95 -100 % reduction) and the ammonia reduction is 50 - 60 %. The producer of the washer says that if it's necessary to increase the reduction to more than 70 %, washing with acid is needed. In the farm visited, washing with water was used.

This two-step washer is not certified yet. The producer (Dr. Siemers) had also a three-step washer which is certified. He is now, on another location, doing measurements to try to get in June 2009 the certificate also for the two-step washer.

The plastic filter has to be cleaned every week. The biofilter (wortels from trees) has to be changed every 5-7 years.



Impressions of the participants

Kerstin's impression

For me it was not the first time I visited the farm in Fahrbinde. But I chose this farm because for me the air abatement technique for a farm of this size is overwhelming. To stand directly in the air stream of the exhaust air and (nearly) not to smell pig-odour. Unfortunately a technique like this, firstly used for such a large farm, is connected with a lot of problems. But in my opinion it can not be developed and getting BAT if it is not required to be used.

Furthermore I want to thank all the participants for their interest, for the good discussions and for the great time we had.

Vincent's impression

It is an example of outside soil exploitation close of the maximal boundary. The manure and the air are enclosed up to treatment (by spreading for the manure, by biofiltration for the air). Some very important investments allow the farmer to limit to the maximum the risks of non-point and accidental pollution.

It is interesting to compare the emissions of an operation like this one with several of more modest dimension having to the whole the same plan capacity.

For IPPC implementation, I noticed the use in the permit of odour units for the emissions with different levels according the kind of inhabitants (village or urban area).

This kind of huge exploitation allows one to distinguish oneself the functions of breeder and agronomist. So I understand well the distinction of the permit for the pigsty and the general rules for spreading. But I was very surprised of the acceptable nitrogen balance: 60 kg NO₃/ha, it's too much.

The choice of including or not the spreading in the permit is very important. In France, the waste producer is responsible until the elimination. So the spreading plan and the spreading specification are included in the permit. In fact, it works well for the lands owned by the farmer himself and not very well for the other lands.

I wonder if the air biofilter has a good ratio efficacy/cost. Like Fausto, I am very interested by some results about this farm or about a similar one (weight pig production, NH₃ produced and reduced).

BATs are a list of means. IPPC farms are obliged to use these BATs or to reach a similar level of emission. So several concerns appear:

- According to the way of using the same technique, the emission level can be very different. Checking the BAT implementation isn't sufficient to give a permit and to monitor the implementation.
- Many emissions depend on several BATs. If one is missing but another is above the average level reached, I think the inspector can attest that the farmer is "right".

It is more difficult to estimate the emission level than the presence-absence of BATs. But it has to be done in the permit determination (in France, at least, it should be) and after the permit can be precise the monitoring means to estimate the annual (or maximal) emission level.

In France, in the inspection form, we do both:

- On site is the BAT implementation
- The other is the emission level¹

But only the first part can be used to enforce the farmer to do something. Even if we do it, the second part is still in question. Why do it if there is no level to reach? The first answer is raise awareness of the farmer. The second is to see if the situation improves or not between two inspections. The third one is to collect figures to carry out an assessment of the IPPC main performances. But that needs a good data management system.

¹The farmer sends a report at least once per ten years (comparison between the former report or the permit application and the situation of the present day). He keeps the monitoring (mainly annual, less than 30 days after spreading for spreading monitoring) in the farm and shows it to the inspector as requested.

Andrew's impression

The regulation of IPPC pig farms in Germany presents an interesting number of aspects. The conditions to be set out in permits are partly driven by conditions set out in legislation established at national level, partly by legislation in each Land and issues determined on a case by case basis. Pig farms are a challenge due to the difficulty in setting precise emission limit values.

Institutional arrangements are also interesting. Permitting is undertaken in an integrated manner, with the farm receiving a single environmental permit. However, inspection involves more than one authority (even covering environmental issues alone). For example, emissions to air and to water are technically inspected by different inspectors, which would mean both would inspect a slurry store for different purposes. While this would, on the surface, suggest a challenge for communication between authorities, it is evident that there is extensive co-operation. It is also important to note that environmental inspectors have restrictions on entering animal stables, due to hygiene restrictions, but environmental issues can be examined by the veterinary inspectors – illustration of further good co-operation.

The farm at Farhbinde was interesting. The farm operator was very co-operative and conditions for slurry storage, transport, feed handling, etc., were well demonstrated. Of particular interest was the ammonia reduction technique. Although explained beforehand, seeing it first hand one could appreciate the scale of the technique. Standing in front of it, it is clear that significant reduction in ammonia concentrations takes place. This technique and variations of it deserve wider examination.

The visit to Germany was, therefore, extremely interesting and beneficial in taking forward a number of aspects of the IMPEL project. I would personally like to thank all of those who helped organise such a successful visit.

Joyce's impression

It was a very interesting visit; I never saw an abatement technique so big as this one.

I thought the legislation would be very different from Holland because the Dutch farmers tell us so, but the differences were not that big. Only because there is much more space at our neighbours there are less different housing systems and abatement techniques. The abatement technique we saw was not working with acid on the first filter which gives an ammonia reduction of 50-60%. In Holland we do not have that kind of system, because of the small country we often have to reduce more ammonia (70-95%).

Different from Holland, the inspector doesn't go into the stables. The veterinary inspector counts the animals and gives his information to the environmental inspector. In Holland this is not possible because we also check all the different housing systems. The different systems and the amount of animals take care for the amount of odour and ammonia which is allowed by permit. Because the inspections are more often and thorough, we have more (mostly pig) farmers who are not keeping the rules and get a warning or have to pay the penalty. Now I see, Holland is actually too small for the big pig-farms...it's better to send them to our neighbours.

Kerstin, you did a lot of the work, I really enjoyed the programme you and your colleagues made and your clear explanation. Also I want to thank the other inspectors for the good time we had!

Joyce van Geenen, the Netherlands

Annex 5: Workshop Agenda

“IMPEL comparison Programme IPPC Pig Farming”

Comparison Programme on permitting and inspection of IPPC pig farming installations in IMPEL Member countries

PROGRAMME FOR THE WORKSHOP AND SITE VISIT

10 – 12 JUNE 2009

Time	Activity	Place	Responsible
Wednesday 10 June			
	Travel		All
12:00 – 13:45	Check in at NH hotel, receive information package and lunch	NH hotel	Participants
14:00	Pick up at hotel, travel to Barneveld	NH hotel	Busmaatschappij Van Delen (backup: Annelies, PTC+)
15:00 – 17:00	Site visit	PTC+ Barneveld	PTC+, Annelies
17:00 – 17:45	DRINK		PTC+, Annelies
17:00 – 17:45	Meeting of chairs Thursday afternoon working groups	PTC+ Barneveld	Margrethe
18:00	Travel from Barneveld to Utrecht by bus		Van Delen (backup: Annelies, PTC+)
19:30	DINNER (offered by Province of Utrecht)	Humphrey's	John
Thursday 11 June			
8:30	ARRIVAL Coffee and tea	SenterNovem Utrecht, Zuid-Holland/ Flevolandzaal C0.04 + C0.14	All
9:00	Welcome , introduction participants		John
9:10	Intro on The Netherlands		Jan
9:15	Key issues		Margrethe
9:30	Joint inspections		John (intro)

Time	Activity	Place	Responsible
9:35	- Italy		Fausto (background), Janneke (photo/video) Tiago (impression)
9:55	- Latvia		Judite (background) Margrethe (photo/video) Manuela (impression)
10:15	- Germany		Kerstin (background) Kerstin (photo/video) Vincent (impression)
10:35	COFFEE BREAK		
11:05	InfoMil and its website		Annelies
11:15	Questionnaire – general background		Andrew
11:45	Workshops afternoon – explanation and group formation		John
12:00	LUNCH BREAK Viadesk available on pc		Annelies/Margrethe
12:45	Group picture		Margrethe
13:00	Workshop in small groups per key issue		5 x about 7 participants
	Manure storage	Overijsselzaal (C03)	Fausto (chair) Janneke (reporter)
	Manure spreading (availability of land, manure, density population)	Noord-Hollandzaal (C13)	Vincent (chair) PM (reporter)
	Housing systems	Limburgzaal (B0.03)	Joyce/Annelies (chair) PM (reporter)
	End of pipe techniques	Frieslandzaal (B0.04)	Judite (chair) Joyce/Annelies (reporter)
	Odour assessment	Zuid-Holland/ Flevolandzaal (C0.04 + C0.14)	Kerstin (chair) Margrethe (reporter)
13:45	TEA BREAK	per room	
14:45	CHANGE to plenary ROOM	SenterNovem Utrecht, Zuid-Holland/ Flevolandzaal C0.04 + C0.14	
15:00	Plenary discussion		Jan Teekens (chair)
15:00	Manure storage		Janneke (10 min report)
15:30	Manure spreading		PM (10 min report)
16:00	CLOSURE		
17:30	City walk	start at NH hotel	John
19:30	DINNER (offered by IMPEL)	Restaurant “De Beleving”	John

Time	Activity	Place	Responsible
Friday 12 June			
9:00	ARRIVAL Coffee and tea	SenterNovem Utrecht, Zuid-Holland/ Flevolandzaal C0.04 + C0.14	
9:30	Plenary discussion (continued)		Jan (chair)
9:30	Housing systems		PM (10 min report)
10:00	End of pipe techniques		Annelies (10 min report)
10:30	Odour assessment		Margrethe (10 min report)
11:00	BREAK		
11:45	Follow up of information exchange network		John
	Follow up of this project		John
	Any other business		John
12:30	CLOSURE		
12:30	LUNCH		
13:30	Core and project team meeting		Core team and project team
15:30	CLOSURE		

Annex 6: Workshop Participants

Name	First name	Country
Babscany	Ildiko	Hungary
Bruce	David	England
Byrne	Patrick	Ireland
Dipane	Judite	Latvia
Elberskirch	Kerstin	Germany
Farmer	Andrew	IEEP
Floean	A. Manuela	Romania
Geenen, van	Joyce	Netherlands
Hadjipetrou	Michael	Cyprus
Hill	Maria	Sweden
Horst	Jeroen	Netherlands
Joelsson	Arne	Sweden
Kalis	Joseph	Czech Republic
Bongers	Margrethe	Netherlands
Martinkova	Mariana	Slovakia
De Barmon	Vincent Nicolazo	France
Prandini	Fausto	Italy
Rasmussen	Anton	Denmark
Robak-Bakierowska	Anna	Poland
Sameiro	Tiago	Portugal
Skinner	Ian	England
Sumak	Romana	Slovenia
Teekens	Jan	Netherlands
Uijtdewilligen	Annelies	Netherlands
Visbeen	John	Netherlands
Voskos	Costas	Cyprus
Wigcheren	Janneke	Netherlands
Kireta	Lucrecija	IMPEL
Grauberg	Llina	Estonia
Knuttel	Bas	Netherlands
Keller	Bernd	Netherlands