EUROPEAN COMMISSION
DIRECTORATE-GENERAL
ENVIRONMENT
Directorate A - Communications, Governance, Production, Consumption and Waste
ENV.A2 - Production, Consumption & Waste

Brussels, 18 December 2003
DG ENV.A.2/LM

DRAFT DISCUSSION DOCUMENT

FOR THE AD HOC MEETING ON BIOWASTES AND SLUDGES

15-16 JANUARY 2004, BRUSSELS

This Working Document is intended as a basis for discussions with stakeholders. It does not necessarily represent the position of the Commission.

Consultation on the
Working Document on sludge and biowaste

Stakeholders are invited to provide comments on this Working Document and to make more general comments or suggestions concerning issues relevant to sludge and biodegradable waste management. Views are particularly sought on the elements contained in Annex I (sewage sludge) and Annex II (biowaste) to this Working Document.

Within the framework of this consultation, stakeholders are also given the opportunity to communicate in writing their positions and concerns on environmental, economic, and social aspects related to it and which would be of interest for the development of an extended impact assessment.

Comments can be submitted to the following address, **preferably by e-mail** in a widely used format (plain text, MS Word, Adobe Acrobat PDF, HTML etc):

- E-mail: env-biowaste@cec.eu.int.
- Fax at +32-2-296.39.80.
  Please mention "Working Document on sludge and biowaste" in the subject.
- Post: Mrs Marianne Klingbeil, Head of Unit A2 on Production, consumption and waste, Office BU-5 5/67, Environment Directorate-General, European Commission, B-1049 Brussels.
  Please mention "Working Document on sludge and biowaste" on the envelope.

Comments should be sent **at the latest by Friday 13 February 2004**. Due to a tight timetable, comments provided after this date may not be taken into consideration.

WORKING DOCUMENT
SLUDGE AND BIOWASTE

1. INTRODUCTION

The Commission announced in the Communication "Toward a Thematic Strategy on soil protection" (COM(2002) 179) that it would present proposals for the revision of the Sewage Sludge Directive 86/278/EEC and for a Directive on the biological treatment of biodegradable waste. Moreover, the Commission has given a commitment that by the end of the year 2004 a Directive on biowaste, including catering waste, will be prepared with the aim of establishing rules on safe use, recovery, recycling and disposal of this waste and of controlling potential contamination (fourth recital in Regulation (EC) No 1774/2002[1]).

It has now been decided to make the development of these two proposals an integral part of the multi-stakeholder process accompanying the development of a fully fledged Soil Thematic Strategy expected to be adopted in September 2004.

This Working Document builds up on the results of stakeholder discussions started in 1999 and 2000 for sludge and biowaste respectively. In particular, it draws from the comments received on the third Working Document on sludge (published in May 2000) and the second Working Document on biowaste (published in February 2001). It is meant to be the basis for discussing the issue of the spreading and use on land of sludge and biodegradable waste with stakeholders. The outcome of such discussion together with the results of the extended impact assessment will be used by the Commission services when finalising the proposals that will be part of the Soil Thematic Strategy.

The content of this Working Document does not necessarily reflect the position of the Commission and does not prejudge the decisions that the Commission will eventually take on the matter.

2. SETTING THE SCENE

Sewage sludge is defined in Article 2(a) of the Sewage Sludge Directive 86/278/EEC[2] as "(i) residual sludge from sewage plants treating domestic or urban waste waters and from other sewage plants treating waste waters of a composition similar to domestic and urban waste waters; (ii) residual sludge from septic tanks and other similar installations for the treatment of sewage; (iii) residual sludge from sewage plants other than those referred to in (i) and (ii)". According to the Report on the implementation of waste legislation[3], in 1999 the EU-15 produced about 7.2 million tonnes of sewage sludge (dry matter) from urban waste water treatment plants. Latest information on disposal and recovery of sludge indicates that 45% is

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[1] Regulation (EC) No 1774/2002 of the European Parliament and of the Council of 3 October 2002 laying down health rules concerning animal by-products not intended for human consumption (OJ L 273, 10.10.2002, p. 1).

[2] Council Directive 86/278/EEC of 12 June 1986 on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture (OJ L 181, 4.7.1986, p. 6).

[3] Report from the Commission to the Council and the European Parliament on the implementation of Community waste legislation for the period 1998-2000, COM(2003) 250 final/3, 11.7.2003, available on http://europa.eu.int/eur-lex/en/com/rpt/2003/com2003_0250en03.pdf.

recycled to land (largely in agriculture), 18% is landfilled, 17% is incinerated and 1% is disposed of to surface water (despite this being prohibited since 1 January 1999). The use of 19% of sludge is not specified[4].

Biodegradable waste is defined in Article 2(m) of the Landfill Directive 1999/31/EC[5] as "waste that is capable of undergoing anaerobic or aerobic decomposition, such as food and garden waste, and paper and paperboard". For the purposes of this Working Document, biowaste is meant to be the biodegradable fraction of municipal solid waste (MSW)[6]. Depending on local conditions, food and drink habits, climate and degree of industrialisation, between 30 and 40% of MSW consists of food and garden waste, and another 20 to 30% consists of paper and cardboard waste. In total, between 60 and 70% of MSW can be considered as biodegradable waste. As the quantity of MSW generated amounts to almost 200 million tonnes, it can be assumed that between 100 and 140 million tonnes of municipal biodegradable waste are produced every year in the EU-15. On average, about 65% of MSW is sent to landfilling, 20% to incineration, 10% to recycling and 5% to composting[7].

3. MANAGEMENT OPTIONS FOR SLUDGE AND BIOWASTE

Traditionally, sludge and biowaste are landfilled, incinerated or landspread. The following two sections are dedicated to the environmental aspects of landfilling and incineration. Given its importance, an entire chapter (Chapter 4) has been dedicated to the positive and negative aspects of landspreading.

3.1. Landfilling

Biodegradable waste decomposes in landfills following a long ecological cycle. The decomposition produces landfill gas and highly polluting leachate. However, the major share of the waste remains in the landfill and the nutrients are not available for plant growth. When less organic matter is landfilled, less landfill gas is produced. Landfill gas, which may only be partially captured, contributes considerably to the greenhouse effect. In fact landfill gas is mainly composed of methane, which is 21 times more powerful than carbon dioxide in terms of climate change effects. It has been calculated[8] that the methane emissions from landfills account for 30% of the global anthropogenic emissions of methane to the atmosphere.

By keeping the organic matter away from landfills the available landfill capacity can be used over a longer period of time. This capacity can be used for materials for which treatment or

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4 Implementation of Council Directive 91/271/EEC of 21 May 1991 concerning urban waste water treatment, as amended by Commission Directive 98/15/EC of 27 February 1998 (in the process of adoption by the Commission).

5 Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste (OJ L 182, 16.7.1999, p. 1).

6 Most of the technical aspects relative to the biological treatment of MSW biowaste would also apply to other types of biowastes, such as animal manure, animal by-products, waste from the agro-food industry etc. The members of the Technical Working Group "Organic Matter" have estimated that more than 95% of exogenous organic matter comes from animal manure, 2-3% from industrial wastes and about 1% from sewage sludge (http://forum.europa.eu.int/Public/irc/env/soil/library?l=/organic_matter/workingsgroup/interimsreports/tasksgroupsreportss/tasks4sresponsessexogeno&vm=detailed&sb=Title).

7 For more detailed information and a breakdown of figures by Member State and Acceeding Countries see Eurostat, Waste generated and treated in Europe, Data 1990-2001, 2003 Edition (in press).

8 COM(96) 557.

reuse is not possible. Furthermore, less space is lost for other purposes, such as infrastructural works – this may especially be of importance in densely populated areas.

These motivations, among others, have guided the adoption of the Landfill Directive 1999/31/EC. Article 5 of the Directive introduces targets for the reduction of biodegradable municipal waste to landfill. The targets and deadlines for reduction of biodegradable waste to landfill are as follows:

- reduction to 75% (by weight) of total biodegradable municipal waste produced in 1995 by 2006;
- reduction to 50% by 2009;
- reduction to 35% by 2016.

3.2. Incineration

Waste incineration is regulated by the Waste Incineration Directive 2000/76/EC, which lays down emission limit values for selected heavy metals and chemical compounds (e.g. NOx, SOx, HCl, particulates, heavy metals and dioxins). The limit values are set in order to prevent and limit as far as practicable negative effects on the environment and the resulting risks to human health.

Incineration of MSW leaves about 30% of the initial waste mass to be dealt with as bottom ash and fly ash. It is possible to extract metals, such as steel and aluminium, from the bottom ash. Indeed, this may be an advantage where wastes consist of mixed materials. However, the price paid for this recovered material is usually far lower than in cases where the material has been source separated since they are usually contaminated (being derived from the slag). It is also possible to use the bottom ash in construction applications, although some concerns remain as to the potential impact of this activity. In the case of fly ash, the toxic nature of residues requires careful handling and disposal to hazardous waste landfill facilities.

When the biodegradable fraction of MSW is incinerated the organic matter is decomposed to carbon dioxide and water. This is short-rotation carbon, thus the energy produced is classified as renewable[9]. However, the majority of energy gained via the incineration of MSW comes from those highly calorific fractions – such as plastics, tyres and synthetic textiles – that are produced from crude oil. The wet fraction of biodegradable waste diminishes the overall energetic efficiency of the incineration process[10]. This means that the combustion of the highly calorific waste fractions is in fact 'helping' the combustion of biodegradable waste. More energy may be gained if biodegradable waste were not to be incinerated along with other wastes. Indeed, refuse-derived fuel (so-called RDF) resulting from the highly calorific fraction of MSW can be used in power plants or cement kilns without the need for dedicated incinerators.

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9 See Article 2(b) in Directive 2001/77/EC of the European Parliament and of the Council of 27 September 2001 on the promotion of electricity produced from renewable energy sources in the internal electricity market (OJ L 283, 27.10.2001, p. 33).

10 See Tables A3.36 and A3.37 on page 118 in A. Smith, K. Brown, S. Ogilvie, K. Rushton, J. Bates, *Waste Management Options and Climate Change*, Final report to the European Commission, DG Environment, by AEA Technology, 2001 (http://europa.eu.int/comm/environment/waste/studies/climate_change.htm).

4. POSITIVE ASPECTS OF SLUDGE AND BIOWASTE RECYCLING TO SOILS[11]

In order to underpin the sustainable development of society, as much as possible of our resources have to be recycled, and recycled responsibly. Measures to prevent waste and to re-incorporate waste in the economic cycle, i.e. waste recovery, are important elements of a comprehensive approach to the resource management aiming at reducing the overall impact of resource use at all stages in the life-cycle[12]. The agricultural sector needs a secure, long term, supply of nutrients to compensate for losses through uptake by crops (harvest, grazing), leakage into groundwater, volatilisation to the atmosphere, and organic matter contributing to the formation of *humus*[13] to compensate for losses through mineralization. Continuous cropping and monoculture reinforce the need of nutrient and organic matter recycling. Sludge and biowaste serve these purposes, albeit to a different degree. Indeed, sewage sludge is primarily a supplier of nutrients (nitrogen, phosphorus and, to a lesser extent, potassium and sulphur), while compost is also a provider of well-stabilised organic matter with soil improving properties, due to its capacity to contribute to the formation of humus, which eventually intervenes to determine the soil characteristics (e.g. water retention capacity, physical stability, reduced erodibility).

4.1. Organic matter recycling & soil depletion

Recycling composted sludge and biodegradable waste in agriculture is considered a way of maintaining or restoring the quality of soils, because of the fertilising or improving properties of the organic matter contained in these materials. This has a special relevance in Southern and Central Europe[14], where it is a valuable instrument for fighting against soil organic matter depletion and, thus, also desertification and soil erosion, particularly in land continuously used in arable production where organic matter levels are decreasing.

It should be pointed out that organic matter and soil characteristics (fertility, structure, erodibility) are related. Any soil needs the correct content of organic matter in order to be productive, not absolutely a high content in all cases. In addition, climatic conditions have to be considered when estimating minimum or optimum soil organic matter levels in terms of self-sustaining soil productivity and fertility (from the agronomic standpoint). It has been sometimes proposed that a level of organic matter ranging between 2.5 and 3% in soil is the bare minimum for long term use of agricultural soils, however soils with less than 1% organic matter are not uncommon in the EU. Estimates[15] indicate that 74% of the land in Southern Europe is covered by soils containing less that 2% organic carbon (less than 3.4% organic matter) in the topsoil (0-30 cm).

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[11] This Chapter draws to a large extent on the information gathered by the members of the Technical Working Group "Organic Matter" in the Interim Report presented on 11 November 2003 to the Advisory Forum set up under the Soil Thematic Strategy, in particular the chapter on "Exogenous organic matter". The Interim Report is available on http://forum.europa.eu.int/Public/irc/env/soil/library?l=/organic_matter/workingsgroup/interimsreports/tasksgroupsreportss/tasks4sresponsessexogeno&vm=detailed&sb=Title.

[12] COM (2003) 301: "Towards a thematic strategy on the prevention and recycling of waste" (http://europa.eu.int/comm/environment/waste/strategy.htm).

[13] Collective term for dark coloured carbonaceous substances in soil generated through slow decomposition of organic substance by the contributory activity of soil micro-organisms.

[14] The United Nation Framework Convention Combating Desertification (UNFCCD, http://www.unccd.ch/) considers South Europe and Central and Eastern European Countries as under the threat of desertification.

[15] P. Zdruli, R. Jones and L Montanarella, *Organic Matter in the Soils in Southern Europe*, Expert Report prepared for DG XI.E.3 by the European Soil Bureau (JRC – Ispra), 29 April 1999.

While there is no agreement among experts on an appropriate level of organic matter in different types of soils (and indeed, if such a notion has any scientific meaning)[16], there is broad consensus that many agricultural soils under intensive crop production have seen decreasing their organic matter content in the last decades. There is also consensus on the fact that organic matter plays a fundamental role in many, if not all, soil functions and that its depletion in certain European regions should be regarded as worrying.

The most effective way for maintaining a good content of organic matter is through appropriate agricultural practices such as correct crop rotation, manuring, green manuring[17], incorporation of crop residues, mulching etc. The application of organic matter contained in well-stabilised biowastes is an important complementary option to be considered. This is particularly relevant in those areas where animal manure and crop residues are not available. The composting process mimics what happens to decaying organic matter in nature and ensures that the organic matter needed by soils is not fully destroyed, but significantly transformed into a slowly-decaying storage of *humus*.

4.2. Fertilisation properties

The concept of fertilisation encompasses a wide variety of parameters to be considered. However, in this section fertilisation is considered only from the viewpoint of the supply of nutrients, such as nitrogen and phosphorus, which are needed for an appropriate growth of commercial crops.

The nutrient content of sludge varies sharply depending on the wastewater type (e.g. urban, industrial) and the treatment it has undergone. The nitrogen (N) content of sludge is one of the main factors in favour of its use. It is generally richest in nitrogen (1 to 6% dry matter) in the liquid phase; the compounds present in the liquid phase are likely to be either compounds which can easily be metabolised or quite simply ammonia compounds which can be used directly by plants. As a result, sludge which has undergone considerable dewatering loses much of its "soluble nitrogen" value. The same applies to sludge which has undergone treatment with lime which, however, can cause extensive loss of nitrogen through volatilisation of ammonia. The proportion of nitrogen present and the chemical forms in which it occurs in sewage sludge depend on the sewage treatment process and subsequent treatment of the sludge. In undigested sludges most of the nitrogen is combined in an organic form. It is thought that 20 to 35% of the nitrogen becomes available to crops in the first season following the application of undigested sludge. Activated sludge is richer in nitrogen than primary sludge and much of the nitrogen present is contained in the bacterial floc, which on application to soil rapidly breaks down with mineralisation of the nitrogen. The digestion process converts rather more than half the total nitrogen into soluble forms, mainly ammonium compounds, which become available to crops following nitrification.

The phosphorus (P) content of sludge is 1 to 2% giving a phosphoric acid content of 3 to 8%. It would appear that 5 to 6% of the total phosphorus is likely to be in the form of organic phosphates, the mineral phosphorus mainly consisting of combinations with compounds of iron, aluminium, calcium and magnesium which abound in most sludges. The phosphorus

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16 Indeed, the matter is still under debate in the Technical Working Group "Organic Matter" under the Soil Thematic Strategy.

17 A method of increasing the fertility of soil by raising suitable herbaceous crops on it, particularly Leguminosae but also Cruciferae and Gramineae, and digging or ploughing them in while succulent, with or without supplementary fertilisers.

content of sludge is higher than that of manure, which explains the attraction of sludge use in agriculture. Under favourable soil conditions[18], close to 50% of the phosphorus contained in the sludge is likely to be available in the year following application. However, if iron and aluminium salts are used to flocculate the sewage or to condition the sludge, it would make the phosphorus present very insoluble and may even cause a reduction in availability of the phosphorus from the fertilisers other than sludge, thus achieving the opposite result to that sought[19].

The concentration of nutrients in the compost is comparatively low. Compost acts primarily as a soil improver rather than as a fertiliser. However, an increase of organic matter content in the soil strongly increases the efficiency of chemical fertilisation and plant nutrition itself, as:

- organic nitrogen is much more slowly released (following mineralization), thus better meeting natural uptake speed (N stemming from mineral fertilisers is often lost to some extent into groundwater, as it gets massively released all at once (nitric fertilisers), or dispersed into the air as NH_3 (ammoniacal fertilisers) particularly during hot weather and when not rapidly incorporated into the soil);

- potassium is protected by the organic matter from absorption at the surface and inside clayey particles;

- phosphorus is protected from co-precipitation with calcium.

An important consideration to bear in mind is that the use of organic fertiliser-like wastes instead of mineral ones does not increase the global nutrient pool within the agricultural and urban systems, which is already problematically large in much of the EU. The same applies to the addition of cadmium, as mineral phosphate fertilisers may contain varying amounts of cadmium impurities[20]. Moreover, the use of organic fertiliser-like wastes can result in energy savings, as for instance the production of a phosphorus-based fertiliser requires shipment of phosphate rocks and an appropriate treatment with sulphuric acid in order to make the phosphorus readily available for plant growth (treatment transforms tri-calcic P – that is not available to roots – into bi-calcic and mono-calcic P, much more available). The process needs energy to be performed.

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18 Phosphorus is normally subject to complex transformation processes in the soil. The concentration of the ions PO_4^{---} in the soil solution (dissolved organic or mineral forms, i.e. the part that can be uptaken by plants or leached down) is normally very low (1 mg/l of P_2O_5 in rich soil). The rest (the most) is fixed (reversibly) by certain soil components (clays, humus, mineral and organic colloids) (labile pool). A balance exists between the dissolved forms and the labile pool (i.e. the conversion from one form to another is reversible). However, the content in soil components that can reversibly bind phosphorus varies with the soil type (sandy vs clay soils). Moreover, even under the same soil type, the availability of phosphorus in dissolved forms may depend on other factors (pH; flooding; organic matter content). Under certain conditions of soil (highly acid or calcareous soils) phosphorus may be even irreversibly blocked in compounds having a very low solubility (non-labile pool).

19 For more information on the different types of sludge treatment processes and their agronomic characteristics, see E. Mugnier, P. Aubain, A. Gazzo, J. Le Moux (ANDERSEN, Environment Risk Consulting Department) and H. Brunet, B. Landrea (SEDE), Disposal and recycling routes for sewage sludge, report on behalf of DG Environment, Part 3 – Scientific and technical report, Chapter 4, pp. 39-46, 2001 (http://europa.eu.int/comm/environment/waste/sludge/sludge_disposal.htm).

20 Cadmium amount in finished fertiliser products is 14-20 mg/kg P_2O_5 (Tunisia), 10-24 mg/kg P_2O_5 (Morocco), 9-15 mg/kg P_2O_5 (Jordan), 250 mg/kg P_2O_5 (USA) (communication of Mr S Tupper of Hammonds Suddards Edge to DG Environment, 17 February 2003).

At the same time, the use of organic fertilisers should be looked at within the context of all fertilisers (mineral and organic) applied to land, to avoid over-fertilisation and saturation of the soil. Fertilisation should be in line with inherent soil characteristics, requirements for crop growth, good farming practices and sustainable production.

4.3. Alternative to peat

Peat is a limited resource with a very long production time. In fact, peat bogs are important refuges for rare and unique species and peat has a fundamental ecological role in water regulation. Peat bogs play an important role in storing carbon that is released as carbon dioxide when a peat bog is damaged. Although peatlands cover around half the surface area covered by tropical rainforests, they contain over three to three and a half times more carbon[21]. Yet these bogs are being destroyed all over the world for conversion to agricultural land, afforestation, and commercial extraction of peat for fuel and horticulture.

Peat dominates the horticultural market because it is a fairly standardised product, therefore well-established and effective. Cropping techniques have been widely based on its properties. Wherever technically possible[22], the use of compost could be encouraged, as it would help reducing the amount of peat that is extracted every year for gardening. Techniques based on lower percentages of peat in growing media are being diffused and have already shown to be effective, above all when cropping practices (e.g. the nutrient load) are adapted. The use of compost also shows some other advantages, e.g. suppressive and buffer power and higher nutrient-holding capacity.

4.4. Green energy & organic matter recycling

The process of anaerobic digestion of organic wastes involves methanogenic bacteria and results in the production of biogas, digestate (solid fraction of the residues) and liquor (liquid fraction of the residues). It is rather sensitive to ambient conditions and is difficult to be artificially reproduced because it involves different methanogenic bacteria which work at different temperatures, pH conditions etc.

Anaerobic digestion produces biogas which is typically made up of 65% methane and 35% carbon dioxide with traces of nitrogen, sulphur compounds, volatile organic compounds and ammonia. This biogas can be combusted directly in modified gas boilers or can be used to run an internal combustion engine. The calorific value of this biogas is typically 17 to 25 MJ/m^3. Typically, between 40% and 60% of the organic matter present is converted to biogas. The remainder consists of an odour free residue with appearance similar to peat which has some value as a soil conditioner and also, with some systems, a liquid residue which has potential as a fertiliser. The EU energy potential of sludges is given as 20,000 GWh/year which is equivalent to 2,500 MW/y. In comparison to the figures for agricultural and MSW feedstocks this is about 20% of the total potential[23].

The choice between composting and anaerobic digestion depends principally on the type of waste to be treated. Generally speaking, anaerobic digestion is more appropriate to a waste

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21 Maltby, E., C. P. Immirzi, D. P. McLaren, *Do Not Disturb! Peatbogs and the Greenhouse Effect*, Friends of the Earth, 1992.

22 See for instance: G.E. Fitzpatrick, *Compost utilization in ornamental and nursery crop production systems,* tables 6.2, 6.3 and 6.4, in "Compost Utilization in Horticultural Cropping Systems", pp. 144-147, edited by J Stoffella and B. A. Kahn, Lewis Publishers, 2001.

23 http://europa.eu.int/comm/energy_transport/atlas/html/adint.html.

with a very high moisture and fat content, while composting is more versatile and efficient for a waste with a high lignin content (methanogenic bacteria are not able to degrade lignin to any significant extent). Moreover, local requirements concerning for example odour emissions, capacity and energy production may be an important factor to consider, as is the fact that anaerobic digestion plants may be more capital intensive and problematic to run from a technical point of view than composting plants.

The issue of the treatment/disposal of the waste water from anaerobic digestion is also an important element to consider given the need to dispose of a relatively high amount of waste water (in composting this may be recycled within the process). A specific advantage of anaerobic digestion is the possibility to process biowaste also with low percentages of bulking agents, such as wood and garden waste. This may be particularly relevant in big cities where there is a relative lack of gardens. Another one is the more compact features of an anaerobic digestion plant compared to a composting one.

Integration of a post-composting step after anaerobic digestion is a way to blend advantages of both processes (recovery of energy and production of high-quality, well-stabilised soil improvers).

4.5. Carbon sink and the greenhouse effect

The decomposition rate of the organic matter in compost has been estimated at around 30-40% during the first year and at a decreasing rate in the following years. A recent study[24] has calculated that, over a 100-year period, the use of compost as a soil amendment would store 54 kg CO_2-equivalent per tonne of compost used, or some 22 kg CO_2-equivalent per tonne of putrescible waste[25] prior to composting. Although this figure is subject to a number of assumptions and considerations that suggest that it should be used with prudence, it can be said that the use of compost from the biodegradable fraction of municipal waste has the potential of storing 1.4·Mt CO_2-equivalent per year in the EU (if the whole putrescible fraction of MSW generated in the EU were to be composted in all Member States)[26].

According to another study[27], benefits may be much higher given the as yet non-measurable effects such as improved workability of soils, reduced erosion (which keeps more organic matter in the surface layer), improved water retention (less energy for irrigation), suppressive power (which implies less energy for the production of pesticides) etc. Although such effects are hardly quantifiable, they are arguably important in a comprehensive assessment of climate change effects.

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24 Smith, A., K. Brown, S. Ogilvie, K. Rushton, J. Bates, *Waste Management Options and Climate Change*, Final report to the European Commission, DG Environment, by AEA Technology, 2001 (http://europa.eu.int/comm/environment/waste/studies/climate_change.htm).

25 The authors of the study have defined putrescible waste as the easily fermentable fraction of biodegradable waste. They have considered that 31% of MSW is putrescible waste and that 29% is paper waste (EU average).

26 To give a term of comparison, the share of waste management in reaching the Kyoto target can be estimated at about 13 Mt CO_2-equivalent per year, as waste management contributes to about 4% of EU emissions and the Kyoto target for the period 2008-2012 is a global EU reduction of 331 Mt CO_2-equivalent per year.

27 Eunomia, "Economic analysis of options for managing biodegradable municipal waste", Final report to DG Environment (http://europa.eu.int/comm/environment/waste/compost/econanalysis_finalreport.pdf).

5. POTENTIAL ENVIRONMENTAL PROBLEMS DUE TO THE APPLICATION OF SLUDGE AND BIOWASTE ON SOILS[28]

The application of sludge and biowaste on soils can pose certain environmental problems mainly related to:

– an excessive and/or unbalanced supply of nutrients,

– the introduction of pollutants, such as heavy metals and organic compounds, and

– the spreading of human, animal or plant pathogens.

5.1. Nutrients

Certain areas and regions in Europe have a euthrophication risk due to a high and unbalanced supply of nitrogen and/or phosphorus to agricultural soils that cannot be absorbed by crops and eventually reaches surface water or is leached to groundwater. This is generally due to a high livestock concentration and to the disposal of huge quantities of animal manure and slurries on a limited surface area. The spreading of organic waste on these areas should be carefully evaluated in order not to exacerbate further the problem.

However, one should also consider that in organic materials such as sludge and compost a fraction of nitrogen and phosphorus may be in an organic form, i.e. with no leaching potential until it is mineralised. For both mature and fresh compost there is plenty of evidence that due to high proportion of organic nitrogen the risk of leaching is very low. Compost has a relatively low content of mineral nitrogen, about 1 to 6% of total nitrogen. Factors influencing the mineralisation of nitrogen are the degree of maturity of compost, the climatic conditions and the soil type.

5.2. Heavy metals[29]

The top layer of soil is of crucial importance for the well being of soil micro-organisms, plants and animals. Some heavy metals may have the effect of impairing the natural mechanisms through which soil microbes reproduce and therefore deplete the bio-potential of the soil eco-system. Moreover, if the concentration is high enough heavy metals can penetrate the natural barriers in plant roots and end up in the edible part of vegetables. Some heavy metals can then accumulate in animal and human organs and cause poisoning effects, induce cancer or produce mutagenic changes.

The spreading of organic waste on land could result in an increase of the concentration levels of heavy metals in soil, particularly in the case of "compost" from mixed MSW or sludge

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[28] This Chapter draws to a large extent on the information gathered by the members of the Technical Working Group "Organic Matter" in the Interim Report presented on 11 November 2003 to the Advisory Forum set up under the Soil Thematic Strategy, in particular the chapter on "Exogenous organic matter". The Interim Report is available on http://forum.europa.eu.int/Public/irc/env/soil/library?l=/organic_matter/workingsgroup/interimsreports/tasksgroupsreportss/tasks4sresponsessexogeno&vm=detailed&sb=Title.

[29] Although strictly speaking the concept of "heavy metal" is not scientifically correct, the expression has become so common in national and Community legislation and even in scientific papers that has been used throughout this Working Document. Here and in the following heavy metals are meant to be cadmium (Cd), chromium (Cr), copper (Cu), mercury (Hg), nickel (Ni), lead (Pb) and zinc (Zn) in metallic form as well as their salts and oxides.

from waste water plants treating large amounts of industrial effluents. In order to ensure that agricultural and indeed any other kind of soil is protected from the long term effects caused by the build-up of heavy metals in soil, it is necessary to control the rate of addition.

According to the information provided by Member States on the implementation of the Sewage Sludge Directive 86/278/EEC for the period 1998-2000, weighted average heavy metal concentrations in sewage sludge in 1999 were as follows:

Heavy metal	mg/kg dry matter
Cd (cadmium)	2.0
Cr (chromium)	73
Cu (copper)	330
Hg (mercury)	1.5
Ni (nickel)	36
Pb (lead)	104
Zn (zinc)	811

In the case of compost, the concentration of heavy metals largely depends on whether feedstock biowaste comes from source segregated materials or not. The following table[30] sums up the noticeable reduction that occurs in compost from source segregated biowaste (BW-C), relative to mixed MSW "compost" (MSW-C):

	Cd	Cr	Cu	Hg	Ni	Pb	Zn
MSW-C	1.7-5.0	70-209	114-522	1.3-2.4	30-149	181-720	283-1570
Median BW-C	0.46	21	47	0.17	17	63	181
90^{th} perc. BW-C	0.89	37	80	0.35	30	105	284

As a term of comparison, the following table sows some typical composition of certain types of animal manure and slurry[31]:

[30] F. Amlinger, M. Pollack, E. Favoino, Heavy metals and organic pollutants from wastes used as organic fertilisers, Draft Final Report to DG Environment, 2003 (unpublished). The median and 90^{th} percentile of BW-C refer to national compost data.

[31] A. Gendebien, R. Ferguson, J. Brink, H. Horth, M. Sullivan and R. Davis (WRc), H. Brunet, F. Dalimier, B. Landrea, D Krack and J. Perot (SEDE) and C. Orsi (REI), Survey of wastes spread on land, Final Report to DG Environment, 2001, Tables 4.3, 4.4, 4.6 and 4.7, pp. 37-41 (http://europa.eu.int/comm/environment/waste/studies/compost/landspreading.htm).

Heavy metal	Cattle manure (mg/kg dm)		Cattle slurry (mg/kg dm)		Pig slurry (mg/kg dm)		Poultry manure (mg/kg dm)	
	Min	Max	Min	Max	Min	Max	Min	Max
Cd (cadmium)	0.1	0.4	0.2	0.6	0.2	0.5	0.38	0.8
Cr (chromium)	0.4	2.6	2.6	15	2.4	18	4.1	24
Cu (copper)	15	75	31	70	180	574	59	100
Hg (mercury)								
Ni (nickel)	1	14	3.3	14	3.2	17	4.9	17
Pb (lead)	1.4	4.3	4.3	5.8	<1	12	2.2	4
Zn (zinc)	63	175	132	750	403	919	403	556

It is interesting to note that compost produced from separately collected biowaste shows heavy metal concentrations which are much closer to those of manure and in some respect lower (e.g. for zinc and copper relative to pig and cattle slurry and poultry manure).

5.3. Organic compounds

There are thousands of chemically synthesised compounds that are used in products and materials commonly used in our everyday life. Many of them are potential contaminants of sewage sludge and biowaste, although, due to their low concentration or easiness to be broken down by micro-organisms, as to the buffering capacity of soils, they do not cause a threat to the environment. However, there are some organic compounds that are not easily broken down during waste treatment and tend to accumulate and be the source of concern due to their eco-toxicity, the eco-toxicity of the products resulting from their degradation or to their potential for bio-accumulation.

There are usually three main reasons why an organic compound may be subject to preventive action:

(a) the break down by soil micro-organisms of the compound concerned is slow (from some months to many years) and therefore there is an actual risk of build-up in the soil;

(b) the organic compound can bio-accumulate in animals and therefore it poses a serious threat to man;

(c) the degradation products of the organic compound are more toxic than the initial compound.

It is essential to address the presence of organic compounds in organic waste in order to ensure that the agronomic benefits ensuing from their use in agriculture are not written off by the chemical contamination that could follow. Restrictions in Member States have focussed on bio-accumulative compounds, such as PAHs, PCBs and PCDD/Fs (dioxins and furanes).

5.4. Pathogens

Much has been done to minimise the potential transmission of pathogens by waste through effective treatment processes and then matching efficiency of pathogen removal to operational restriction on application practices and land use. For solid wastes, the most important factor influencing pathogen die-off rate is the couple time-temperature during the treatment process.

There is little evidence of disease in man or animals arising from land application of biowaste, including sludge. The few documented cases have occurred when local regulations or codes of practice have not been observed. However, generally the source of isolated cases of infection are not investigated or identified. A monitoring of health effects on animals due to the spreading of sewage sludge exists since 1987 in France. From 1987 to 1991, only one case of animal pathology was raised: a hearth of bovine tuberculosis in a herd grazing in edge of an abattoir sewage sludge storage area. Between 1991 and 1999, only another case was announced: the death of mare (storage of sludge and hiding not in conformity). In both cases, the evaluation of the facts showed that the general hygienic and prevention rules were not respected.

6. POSSIBLE WAY FORWARD

An improved management of sewage sludge and biowaste should reach these two objectives:

(1) Ensure that the landspreading of sludge and biowaste happen in a cost-effective manner and in such conditions that the potential drawbacks, in particular possible negative effects to human and animal health, wildlife and biodiversity and long-term impact on soil quality, are minimised and the positive aspects, notably from an agronomic point of view, are maximised.

(2) Support an integrated approach to waste management and natural resources by promoting material recycling, the closing of the nutrient loop and minimising final disposal, while recognising the need for favourable conditions for investments in the treatment companies.

These two major objectives are mutually complementary and supportive of sustainable development. The need to create the conditions encouraging the emergence and the strengthening of a EU market for compost and sludge has also to be carefully taken into consideration.

6.1. Sewage sludge

The use of sewage sludge is currently regulated by Directive 86/278/EEC. The experience gained so far in the EU has shown three main weaknesses of this Directive, which:

- basically only covers urban sludge (i.e. sludge from the treatment of domestic or urban waste water or waste water of a composition similar to domestic and urban waste water), but does not consider other non-hazardous sludges (e.g. paper sludges or textile sludges) that may have the similar negative and positive implications as urban sludge when they are spread on land;

- regulates the spreading of sewage sludge to agricultural land only but does not provide for any measure as regards other types of land use. Although the protection of agricultural soils is of primary importance for the production of good quality food, the spreading of sludges on non-agricultural land (e.g. tree plantations, green areas, landscaping purposes etc) may have potential adverse impacts on human health (children in particular) and on wildlife and biodiversity;

- it is not conservative enough in taking into account the effects of long term accumulation of heavy metals to the topsoil. Although reaching the upper threshold limits for heavy metal concentrations in agricultural soil provided for by Annex I A of Directive 86/278/EEC do not pose any *immediate* risk to human and animal health, these upper limits do not seem to be protective enough for soil quality in the long term, to ensure that future generation inherit of an environment as less polluted as possible and of an agricultural land that maintains its agronomic value.

A revision of Directive 86/278/EEC to address these points is therefore an option to consider. A detailed list of elements to be discussed is in **Annex I** to this Working Document.

6.2. Biowaste

The biological treatment of biodegradable waste and the use of compost and digestate is currently not subject to EU rules. This may result in the production and marketing of low quality "compost" from unsorted waste (properly speaking, this material should be called "stabilised biowaste") and eco-dumping, when low quality "compost" is shipped to those regions lacking proper treatment and application standards for biowaste. Moreover, the lack of well defined drivers for supporting the biological treatment of biodegradable waste is hampering the development of an economically sound recycling industry, as local authorities willing to support pilot separate collection schemes and compost production often do not find enough treatment capacity. Conversely, private investors do not build composting and anaerobic digestion plants for the biodegradable fraction of municipal waste if they are not sure of a steady supply of waste of sufficient high quality to allow the marketability of their final product. Nor are they willing to install capacities only for pilot schemes, due to problems related to economy of scale.

An element to be considered for a comprehensive overview of issues and opportunities related to biowaste management refers to the possible role of mechanical-biological treatment (MBT) of mixed or residual waste (mixed MSW "composting").

MBT may play an important role as a complementary treatment option along the lines of the provisions of the Landfill Directive, which requires a pre-treatment of the waste to be landfilled to achieve further reduction of its biodegradability. It may also be well integrated with energy recovery from residual waste, whose pre-treatment may improve conditions for thermal treatment, giving the system the needed flexibility to cope with variations of calorific value as a consequence of progressive growth of the biological treatment of biowaste. It would be important to define conditions for the MBT process and rules relative to the use of MBT residues. The objectives could be to clearly distinguish MBT residues from high-quality compost. At the same time, MBT process parameters could be optimised in order to reduce the biodegradability of MBT residues in case of landfilling.

An option to consider for addressing the existing unsatisfactory situation includes the elaboration of a legislative instrument, aiming at achieving the following objectives:

- Promoting the biological treatment of biowaste by harmonising the national measures concerning its management in order to prevent or reduce any negative impact thereof on the environment, thus providing a high level of environmental protection.

- Protecting the soil and ensure that the use of treated and untreated biowaste results in benefit to agriculture or ecological improvement.

- Ensuring that human as well as animal and plant health is not affected by the use of treated or untreated biowaste.

- Ensuring the functioning of the internal market and to avoid obstacles to trade and distortion and restriction of competition within the Community.

A detailed list of elements to be discussed is in **Annex II** to this Working Document.

Annex I

Sewage sludge

In the following the reader will find the major points proposed for discussion for revising the provisions of Directive 86/278/EEC.

- The definition of sludge should be modified in order to avoid the tautological wording of the existing definition and to make clearer what kind of wastewaters and thus of sludges are covered by the Directive. A reference should be made to the European Waste Catalogue[32] to clarify that certain wastes produced during the treatment of waste water (e.g. screenings and waste from desanding) should not be considered sludge.

- Whenever possible, the use of sludge on land should be close to the production site to avoid the environmental impacts caused by transport and favour a better control of sludge quality.

- The scope should be broadened to include industrial sludges fit for landspreading operations in such a way as to exclude those sludges that are hazardous or, albeit non-hazardous, unfit for being spread on land.

- The scope should also be extended to non-agricultural land. Use restrictions should be set accordingly, thereby improving the existing situation where only agricultural land is covered.

- The use of sludge in natural forests, as defined in the context of the Forest Focus initiative[33], should be prohibited for preserving these important ecosystems on which an addition of nutrients would not be appropriate.

- Directive 91/676/EEC sets up limits to the maximum amount of nitrogen from livestock manure which can be applied to land each year. In Nitrate Vulnerable Zone, the same restrictions on maximum nitrogen input from sludge should be introduced.

- The concept of advanced and conventional treatments should be introduced, so as to allow economic operators to use sludge with fewer restrictions when a higher level of pathogen reduction with an advanced treatment is achieved as compared to a sludge which is conventionally treated. However, the so-called "dual-barrier approach"[34] of Directive 86/278/EEC should be maintained for conventionally treated sludges that would be subject to reinforced land use restrictions to minimise the risks to human health, farmed animals, wildlife and soil long-term quality.

- In order to make effective, in sludge management, the principle contained in Article 174 of the EC Treaty that environmental damage should be rectified at source, Member States could be required to take appropriate measures designed to reduce the amount of pollutants

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[32] European Waste Catalogue pursuant to Article 1(a) of Council Directive 75/442/EEC on waste as amended and adopted with Commission Decision 94/3/EC (OJ L 5, 7.1.1994, p. 15) as last mended by Commission Decision 2001/118/EC (OJ L 47, 16.2.2001, p. 1).

[33] Proposal for a European Parliament and Council Regulation concerning monitoring of forests and environmental interactions in the Community – Forest Focus (COM(2002) 404 final, 15.7.2002).

[34] The combination of treatment requirement and use restrictions.

(heavy metals and organic compounds) that end up in the sewer, and therefore in sewage sludge. This measure would constitute an innovation as compared to Directive 86/278/EEC, which had an end-of-pipe approach.

- The aforementioned measures could be designed in such a way as to reach the long-term goal of making 75% of urban sludge *in principle* suitable for landspreading in the whole of the enlarged EU within 20 years. In this context, soil protection is deemed to imply a steady state condition for heavy metal inputs to soils that would guarantee that total background concentrations are not dramatically increased in the long term.

- The maximum allowable concentrations for heavy metals in sludge could be lowered. This would allow a reduction of the overall input of heavy metals to the environment in general and the soil in particular. The threshold limits should allow the use on land of the majority of sludges produced in the EU with the exception of the most polluted ones.

- The threshold for heavy metal concentrations in soil could be reduced to better reflect existing soil maximum background concentrations in "natural" agricultural soils. Soils, in particular agricultural soils, are a finite and precious resource and should be protected to the extent possible. The proposed heavy metals threshold in soils would be inherently precautionary and aim at preserving agricultural soil quality, and thus farming opportunities, for future generations.

- Directive 86/278/EEC, due to the level of scientific knowledge and analytical possibilities at the time of its adoption, did not consider laying down threshold limit values for organic compounds. It could be envisaged introducing some guideline values for persistent, toxic and/or bioaccumulative organic compounds. The aim would be twofold. On the one hand, to ensure a high level of human and animal health protection, in particular concerning spreading of sludge on agricultural land where food and feed crops are cultivated. On the other, to take in due account public concern and the perception that the general public has of sludge (urban sludge in particular) as of being highly polluted.

- Member States would be free to restrict the rules regarding the landspreading of sludge, including any prohibition of landspreading on certain types of soils or land uses.

- An important aspect where Directive 86/278/EEC has been found particularly deficient with time is the aspect relative to the sampling and analytical standard methods to be used to measure the parameters (e.g. pH and heavy metal concentrations) mentioned in the Directive. The adoption and the development of European horizontal standards should be promoted for enhancing the comparability of data within and among Member States. In this context, the Commission has actively participated in the setting up of a research consortium called "Horizontal" to which many Member States are also contributing. Main task of this consortium is the elaboration of horizontal standards in the fields of sludge, biowaste and soil. It is expected that the first standards should be available in 2006.

Annex II

Biowaste

In the following the reader will find the major points proposed for discussion for improving the management of biowaste.

- Home composting, which is the most environmentally friendly way of handling domestic biodegradable waste, could be promoted and actively encouraged. For instance, local authorities could provide households with 'biobins' or other tools to compost in the backyard (textile covers, mesh-wire containers etc) and/or give tax breaks to those households which reduce the amount of biodegradable waste to be collected. Educational programmes at the local level could be encouraged.

- Community composting is also a valuable approach fully in line with the proximity principle. This may be entitled to simplified procedures for permitting/control.

- A key-point in a successful strategy for compost promotion would be the separate collection of biodegradable waste. The actual separate collection scheme adopted (kerbside, door-to-door, through civic amenity sites etc) would be up to local authorities in order to take account of differences in climate, local habits, constraints due to topography, location of the composting plant, amount of money available etc. Compost should be considered a product only if it has been produced from separately collected biowaste.

- In order to provide a "driver effect" for local authorities and the concerned industry, it should be evaluated whether an obligation of separate collection of the biowaste fraction of MSW should be introduced across the EU, or recycling targets should be set (to be evaluated whether in percentage of total biowaste production or in absolute terms), or none of the above, if the diversion targets of the Landfill Directive are considered to be sufficient.

- Provisions should provide for minimum process requirements (residence time, temperature, environmental conditions etc) for anaerobic digestion, composting and mechanical/ biological treatment (MBT) in order to ensure that the best techniques and standards are applied. This would be a crucial point in terms of market possibility for compost and of possible destinations for stabilised biowaste. Sanitisation requirements with respect to animal and human welfare should be introduced and sanitisation requirements for plant protection could be considered.

- It could be envisaged to consider that separately collected biowaste being subject to a defined composting process resulting in the production of a high quality compost meeting specified quality standards has undergone a recovery operation in the sense of operation R3 ("Recycling/reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes)") in Annex IIB to Directive 75/442/EEC[35]. Hence, the use of compost would not be subject to Directive 75/442/EEC.

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[35] Council Directive 75/442/EEC of 15 July 1975 on waste (OJ L 194, 25.7.1975, p. 39). Directive as amended by Council Directive 91/156/EEC of 18 March 1991 (OJ L 78, 26.3.1991, p. 31).

- The use of digestion residues from anaerobic digestion should be subject to Directive 75/442/EEC and to a monitoring system equivalent to the one in force for sewage sludge in case of landspreading, unless they are composted.

- The production of energy from the combustion of biogas produced with the anaerobic digestion of biowaste is classified as renewable energy in accordance with Directive 2001/77/EC[36]. As anaerobic digestion also results in the production of a solid residue (digestate) that can be composted and used on land, it may be considered as a combination of energy recovery and material recycling. In case of the existence of national targets for both energy recovery and material recycling, the elaboration of harmonised guidelines for determining which share of the incoming biowaste has been energetically recovered and which has been recycled could be envisaged.

- The land spreading of stabilised biowaste produced from mechanical/biological treatment (MBT) of mixed MSW or residual waste can potentially present the same problems and opportunities of the landspreading of sewage sludge. In the long run, it can hardly be subject to any improvement of quality, as contamination does not come primarily from point sources as in the case of sludge. To avoid any confusion with compost produced from separately collected waste, the residue from MBT should not be called "compost". Its application should be restricted only to land where food and feed crops are not cultivated, e.g. for landscaping purposes.

- It could be envisaged introducing certain technical specification for MBT-treated biowaste to be landfilled, in such a way that stabilised biowaste would not be considered actively biodegradable any more. When these conditions, which should refer to residual fermentability, are fulfilled, the landfilling of such MBT-treated biowaste should not count against the targets of Article 5 of the Landfill Directive 1999/31/EC[37].

- Unless already required under the IPPC Directive[38], biological treatment plants should have a permit which would provide for some basic guarantees such as health and safety requirements for workers, treatment of leachates, lining under the compost heap to protect groundwater, odour control and minimum distances from buildings (unless capacity and materials suggest otherwise, e.g. for small scale composting plants of garden waste).

- Community-wide quality requirements would be an essential element to the establishment of a healthy market for compost. They should fix the maximum tolerable levels of pollutants (heavy metals? organic compounds?) as well as pathogens and account should be taken of sanitisation aspects. These levels should be based on sound scientific evidence, on the experience of Member States, on concepts for long-term safe application, and should be able to appease the concerns linked with the use of waste-derived products in agriculture.

- In order to provide end users with a product of guaranteed quality, easy to recognise and with the same characteristics in all Member States, composts should be classified

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36 Directive 2001/77/EC of the European Parliament and of the Council of 27 September 2001 on the promotion of electricity produced from renewable energy sources in the internal electricity market (OJ L 283, 27.10.2001, p. 33).

37 Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste (OJ L 182, 16.7.1999, p. 1).

38 Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control (OJ L 257, 10.10.1996, p. 26).

according to the level of impurities and nutrients. Different types of quality could be envisaged. They would be feedstock and process depending and would allow Member States to produce composts of different qualities for different uses which would nevertheless be marketable in the whole of the EU. Different types could allow a differentiation of uses, for instance use in pots for most mature composts and agriculture/ horticulture preferably for composts with a highest content of nutrients.

- Along with classification parameters, labelling requirements could be needed in order to inform end users of the feedstock material (separately collected biodegradable waste, garden waste, organic fraction from unsorted MSW, sewage sludge, green waste), of the characteristics of the product (organic matter, nutrients, pH, salinity, pollutants), of its correct use (soil improver, growing media, mulch), of its rate of application (to take account of the nutrient load).

- Standard sampling procedures, harmonised at EU level, could be introduced. This would be a rather important point insofar trade between Member States is concerned because classification and labelling of compost should be uniform in the EU and this is heavily dependent on common sampling criteria and procedures. In this context, the Commission has actively participated in the setting up of a research consortium called “Horizontal” to which many Member States are also contributing. Main task of this consortium is the elaboration of horizontal standards in the fields of sludge, biowaste and soil. It is expected that the first standards should be available in 2006.

- Public authorities and the public sector could encourage the use of compost as a substitute for peat and other raw materials extracted from the environment whenever possible, in particular as a component in soil improvers, growing media, mulches, potting soil and in soil dressing for landscaping purposes. Appropriate measures to encourage the use of compost in public procurement contracts could be established. The Commission Interpretative Communication on the Community law applicable to public procurement and the possibilities for integrating environmental considerations into public procurement[39] explains how contracting authorities can define technical specifications related to environmental performance of a product in line with “Eco-label” criteria[40].

- There could be a possibility for adopting provisions for the testing, labelling and entry into the market of materials, particularly packaging, deemed to be compatible with the biological treatment of biodegradable waste. In particular, it could be proposed that a harmonised packaging logo be adopted at Community level. This logo would allow the general public an informed choice about packaging materials and would help in the separate collection of biodegradable waste. Proposals from interested parties for a Community logo indicating suitability for biological treatment are welcome.

Relationship with the Animal By-Products Regulation (ABPR)[41]

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[39] COM(2001) 274 final, 4.7.2001 (http://europa.eu.int/comm/environment/gpp/index.htm).

[40] It may be of interest to remind the reader of the existence of an eco-label for soil improvers and growing media (Commission Decision of 28 August 2001 establishing ecological criteria for the award of the Community eco-label to soil improvers and growing media (2001/688/EC), OJ L 242, 19.12.2001, p. 17).

[41] Regulation (EC) No 1774/2002 of the European Parliament and of the Council of 3 October 2002 laying down health rules concerning animal by-products not intended for human consumption (OJ L 273, 10.10.2002, p. 1).

The ABPR regulates the collection, transport, storage, handling, processing and use or disposal of animal by-products, which are defined as the entire bodies or parts of animals or products of animal origin referred to in Articles 4, 5 and 6 of the Regulation, not intended for human consumption.

The treatment of animal by-products (including catering waste) in a composting or biogas plant is included in the scope of the Regulation. Catering waste is defined as "all food including used cooking oil originating in restaurants, catering facilities and kitchens, including central kitchens and household kitchens" (point 15 in Annex I to the Regulation as modified by Commission Regulation (EC) No 808/2003[42]). By virtue of Article 6(1)(l), catering waste (save for catering waste from means of transport operating internationally) is defined as a Category 3 material.

Article 6(2)(g) of the Regulation stipulates that Category 3 catering waste shall be transformed in a biogas plant or composted in accordance with rules laid down under the procedure referred to in Article 33(2) of the Regulation or, pending the adoption of such rules, in accordance with national law.

Moreover, in the fourth recital of the Regulation, it is said that the Regulation should not affect the application of existing environmental legislation or hinder the development of new rules on environmental protection, particularly as regards biodegradable waste. In this regard, the Commission has given a commitment that by the end of the year 2004 a Directive on biowaste, including catering waste, will be prepared with the aim of establishing rules on safe use, recovery, recycling and disposal of this waste and of controlling potential contamination.

This means that, pending the adoption of EU rules (i.e. the Directive on the biological treatment of biodegradable waste), composting and anaerobic digestion of biodegradable waste containing catering waste is subject to national rules.

Article 22(1)(c) of the Regulation prohibits the application to pastureland of organic fertilisers and soil improvers[43], other than manure. However, the Commission has declared that it can accept that Member States may continue to allow the spreading on pastureland of digestion residues and compost from Category 3 material, providing that farmed animals are not allowed to graze for at least three weeks, until implementation measures are harmonised, and subject to the condition that the competent authority supervises effectively the spreading of the materials concerned against the risks to human and animal health, in accordance with all applicable control provisions.

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[42] Commission Regulation (EC) No 808/2003 of 12 May 2003 amending Regulation (EC) No 1774/2002 of the European Parliament and of the Council laying down health rules concerning animal by-products not intended for human consumption (OJ L 117, 13.5.2003, p. 1).

[43] The definition of organic fertilisers and soil improvers in point 38 of Annex I reads "materials of animal origin used to maintain or improve plant nutrition and the physical and chemical properties and biological activities of soils, either separately or together; they may include manure, digestive tract content, compost and digestion residues".