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**COUNCIL DIRECTIVE**

**of 12 June 1986**

**on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture**

(86/278/EEC)

(OJ L 181, 4.7.1986, p. 6)

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▼B**COUNCIL DIRECTIVE****of 12 June 1986****on the protection of the environment, and in particular of the soil,  
when sewage sludge is used in agriculture**

(86/278/EEC)

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community, and in particular Articles 100 and 235 thereof,

Having regard to the proposal from the Commission<sup>(1)</sup>,

Having regard to the opinion of the European Parliament<sup>(2)</sup>,

Having regard to the opinion of the Economic and Social Committee<sup>(3)</sup>,

Whereas the aim of this Directive is to regulate the use of sewage sludge in agriculture in such a way as to prevent harmful effects on soil, vegetation, animals and man, while encouraging its correct use;

Whereas the disparity between the Member States' provisions on the agricultural applications of sewage sludge might affect the functioning of the common market; whereas in this field the approximation of laws provided for under Article 100 of the Treaty should therefore be instigated;

Whereas sewage sludge used in agriculture is not covered by Council Directive 75/442/EEC of 15 July 1975 on waste<sup>(4)</sup>;

Whereas the measures for which provision is made in Council Directive 78/319/EEC of 20 March 1978 on toxic and dangerous waste<sup>(5)</sup> also apply to sewage sludge containing or contaminated by substances or materials listed in the Annex to that Directive which are of such a nature or are present in such quantities or concentrations that they represent a hazard to human health or to the environment;

Whereas special arrangements should be made to ensure that man, animals, plants and the environment are fully safeguarded against the harmful effects arising from the uncontrolled use of sludge;

Whereas this Directive also aims at establishing certain initial Community measures in connection with soil protection;

Whereas sludge can have valuable agronomic properties and it is therefore justified to encourage its application in agriculture provided it is used correctly; whereas the use of sewage sludge must not impair the quality of the soil and of agricultural products;

Whereas some heavy metals may be toxic to plants and also to man through their presence in crops and whereas it is necessary to lay down mandatory limit values for these elements in the soil;

Whereas the use of sludge should be prohibited when the concentration of these metals in the soil exceeds these limit values;

Whereas, moreover, it is necessary to prevent these limit values from being exceeded as a result of the use of sludge; whereas, to this end, it is necessary to limit the amount of heavy metals added to cultivated soil either by setting maximum quantities for the amounts of sludge used per annum and ensuring that the limit values for the concentration of heavy metals in the sludge used are not exceeded or by seeking to ensure that limit values for the quantities of heavy metals that can be added to the soil on the basis of a 10-year average are not exceeded;

<sup>(1)</sup> OJ No C 264, 8. 10. 1982, p. 3 and OJ No C 154, 14. 6. 1984, p. 6.

<sup>(2)</sup> OJ No C 77, 19. 3. 1984, p. 136.

<sup>(3)</sup> OJ No C 90, 5. 4. 1983, p. 27.

<sup>(4)</sup> OJ No L 194, 25. 7. 1975, p. 39.

<sup>(5)</sup> OJ No L 84, 31. 3. 1978, p. 43.

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Whereas sludge must be treated before being used in agriculture; whereas Member States may nevertheless authorize, on certain conditions, the use of untreated sludge, without risk to human or animal health, if it is injected or worked into the soil;

Whereas a certain period must elapse between using the sludge and putting stock out to pasture or harvesting fodder crops or certain crops which are normally in direct contact with the soil and normally consumed raw; whereas the use of sludge on fruit and vegetable crops during the growing season, except for fruit-tree crops, must be prohibited;

Whereas sludge should be used under conditions which ensure that the soil and the surface and ground water are protected, in accordance with Directives 75/440/EEC <sup>(1)</sup> and 80/68/EEC <sup>(2)</sup>;

Whereas to this end it is necessary to monitor the quality of sludges and of the soils on which they are used and hence to make analyses and to communicate certain results to the users;

Whereas a certain amount of essential information should be kept to ensure better awareness of the use of sludge in agriculture and whereas such information should be forwarded in the form of periodic reports to the Commission; whereas, in the light of these reports, the Commission will if necessary draw up proposals to ensure greater protection for the soil and the environment;

Whereas sludge from small sewage-treatment plants which treat primarily domestic waste water represents little danger to human, animal and plant health and to the environment and should therefore be exempt from some of the obligations laid down relating to information and analysis;

Whereas Member States should be able to draw up more stringent provisions than those laid down in this Directive; whereas such provisions should be communicated to the Commission;

Whereas technical and scientific progress may make necessary the rapid adaptation of certain of the requirements laid down in this Directive; whereas, in order to facilitate the introduction of the measures required for this purpose, a procedure should be laid down whereby close cooperation could be established between the Member States and the Commission; whereas such cooperation should take place within a Committee on Adaptation to Technical and Scientific Progress;

Whereas the Treaty has not provided the necessary powers, other than those of Article 235,

HAS ADOPTED THIS DIRECTIVE:

*Article 1*

The purpose of this Directive is to regulate the use of sewage sludge in agriculture in such a way as to prevent harmful effects on soil, vegetation, animals and man, thereby encouraging the correct use of such sewage sludge.

*Article 2*

For the purposes of this Directive:

(a) 'sludge' means:

- (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;

<sup>(1)</sup> OJ No L 194, 25. 7. 1975, p. 26.

<sup>(2)</sup> OJ No L 20, 26. 1. 1980, p. 43.

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- (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);
- (b) 'treated sludge' means:
- sludge which has undergone biological, chemical or heat treatment, long-term storage or any other appropriate process so as significantly to reduce its fermentability and the health hazards resulting from its use;
- (c) 'agriculture' means:
- the growing of all types of commercial food crops, including for stock-rearing purposes;
- (d) 'use' means:
- the spreading of sludge on the soil or any other application of sludge on and in the soil.

*Article 3*

1. The sludge referred to in Article 2 (a) (i) may only be used in agriculture in accordance with this Directive.
2. Without prejudice to Directives 75/442/EEC and 78/319/EEC:
  - the sludge referred to in Article 2 (a) (ii) may be used in agriculture subject to any conditions that the Member State concerned may deem necessary for the protection of human health and the environment,
  - the sludge referred to in Article 2 (a) (iii) may be used in agriculture only if its use is regulated by the Member State concerned.

*Article 4*

Values for concentrations of heavy metals in soil to which sludge is applied, concentrations of heavy metals in sludge and the maximum annual quantities of such heavy metals which may be introduced into soil intended for agriculture are given in Annexes I A, I B and I C.

*Article 5*

Without prejudice to Article 12:

1. Member States shall prohibit the use of sludge where the concentration of one or more heavy metals in the soil exceeds the limit values which they lay down in accordance with Annex I A and shall take the necessary steps to ensure that those limit values are not exceeded as a result of the use of sludge.
2. Member States shall regulate the use of sludge in such a way that the accumulation of heavy metals in the soil does not lead to the limit values referred to in paragraph 1 being exceeded. To achieve this, they shall apply one or other of the procedures provided for in (a) and (b) below:
  - (a) Member States shall lay down the maximum quantities of sludge expressed in tonnes of dry matter which may be applied to the soil per unit of area per year while observing the limit values for heavy metal concentration in sludge which they lay down in accordance with Annex I B; or
  - (b) Member States shall ensure observance of the limit values for the quantities of metals introduced into the soil per unit of area and unit of time as set out in Annex I C.

*Article 6*

Without prejudice to Article 7:

- (a) sludge shall be treated before being used in agriculture. Member States may nevertheless authorize, under conditions to be laid

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down by them, the use of untreated sludge if it is injected or worked into the soil;

- (b) sewage-sludge producers shall regularly provide users with all the information referred to in Annex II A.

*Article 7*

Member States shall prohibit the use of sludge or the supply of sludge for use on:

- (a) grassland or forage crops if the grassland is to be grazed or the forage crops to be harvested before a certain period has elapsed. This period, which shall be set by the Member States taking particular account of their geographical and climatic situation, shall under no circumstances be less than three weeks;
- (b) soil in which fruit and vegetable crops are growing, with the exception of fruit trees;
- (c) ground intended for the cultivation of fruit and vegetable crops which are normally in direct contact with the soil and normally eaten raw, for a period of 10 months preceding the harvest of the crops and during the harvest itself.

*Article 8*

The following rules shall be observed when using sludge:

- the sludge shall be used in such a way that account is taken of the nutrient needs of the plants and that the quality of the soil and of the surface and ground water is not impaired,
- where sludge is used on soils of which the pH is below 6, Member States shall take into account the increased mobility and availability to the crop of heavy metals and shall, if necessary, reduce the limit values they have laid down in accordance with Annex I A.

*Article 9*

Sludge and soil on which it is used shall be analyzed as outlined in Annexes II A and II B.

The reference methods for sampling and analysis are indicated in Annex II C.

*Article 10*

1. Member States shall ensure that up-to-date records are kept, which register:

- (a) the quantities of sludge produced and the quantities supplied for use in agriculture;
- (b) the composition and properties of the sludge in relation to the parameters referred to in Annex II A;
- (c) the type of treatment carried out, as defined in Article 2 (b);
- (d) the names and addresses of the recipients of the sludge and the place where the sludge is to be used.

2. The records shall be available to the competent authorities and shall provide a basis for the consolidated report referred to in Article 17.

3. Information on the methods of treatment and the results of the analyses shall be released upon request to the competent authorities.

*Article 11*

Member States may exempt from Article 6 (b) and Article 10 (1) (b), (c) and (d) and paragraph 2, sludge from sewage treatment plants with a treatment capacity below 300 kg BOD<sub>5</sub> per day, corresponding to 5 000 person equivalents, which are designed primarily for the treatment of domestic waste water.

**▼B***Article 12*

Where conditions so demand, Member States may take more stringent measures than those provided for in this Directive.

Any decision of this nature shall be communicated to the Commission in accordance with existing agreements.

*Article 13*

Adaptation to technical and scientific progress, in accordance with the procedure referred to in Article 15, shall cover the provisions of the Annexes to the Directive, except for the parameters and values listed in Annexes I A, I B and I C, any factors likely to affect the evaluation of the values, and the parameters for analysis referred to in Annexes II A and II B.

*Article 14*

1. A committee for adapting this Directive to technical and scientific progress (hereinafter called 'the Committee') is hereby set up. It shall consist of representatives of the Member States with a representative of the Commission as chairman.
2. The Committee shall draw up its own rules of procedure.

*Article 15*

1. Where the procedure laid down in this Article is to be followed, matters shall be referred to the Committee by the chairman, either on his own initiative or at the request of the representative of a Member State.
2. The representative of the Commission shall submit to the Committee a draft of the measures to be adopted. The Committee shall deliver its opinion on the draft within a period to be determined by the chairman according to the urgency of the matter. It shall decide by a majority of 54 votes, the votes of the Member States being weighted as provided for in Article 148 (2) of the Treaty. The chairman shall not vote.
3. (a) The Commission shall adopt the measures envisaged where these are in accordance with the opinion of the Committee.  
(b) Where the measures envisaged are not in accordance with the opinion of the Committee or if no opinion has been given, the Commission shall forthwith propose to the Council the measures to be adopted. The Council shall act by a qualified majority.  
(c) If, within three months of the proposal being submitted to it, the Council has not acted, the measures proposed shall be adopted by the Commission.

*Article 16*

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive within three years of its notification.

They shall forthwith inform the Commission thereof.

2. Member States shall communicate to the Commission the texts of the provisions of national law which they adopt in the field governed by this Directive.

**▼B***Article 17***▼M1**

At intervals of three years Member States shall send information to the Commission on the implementation of this Directive, in the form of a sectoral report which shall also cover other pertinent Community Directives. The report shall be drawn up on the basis other of a questionnaire or outline drafted by the Commission in accordance with the procedure laid down in Article 6 of Directive 91/692/EEC<sup>(1)</sup>. The questionnaire or outline shall be sent to the Member States six months before the start of the period covered by the report. The report shall be made to the Commission within nine months of the end of the three-year period covered by it.

The first report shall cover the period 1995 to 1997 inclusive.

The Commission shall publish a Community report on the implementation of the Directive within nine months of receiving the reports from the Member States.

**▼B***Article 18*

This Directive is addressed to the Member States.

<sup>(1)</sup> OJ No L 377, 31. 12. 1991, p. 48.

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## ANNEX I A

## LIMIT VALUES FOR CONCENTRATIONS OF HEAVY METALS IN SOIL

(mg/kg of dry matter in a representative sample, as defined in Annex II C, of soil with a pH of 6 to 7)

Parameters	Limit values <sup>(1)</sup>
Cadmium	1 to 3
Copper <sup>(2)</sup>	50 to 140
Nickel <sup>(2)</sup>	30 to 75
Lead	50 to 300
Zinc <sup>(2)</sup>	150 to 300
Mercury	1 to 1,5
Chromium <sup>(3)</sup>	—

<sup>(1)</sup> Member States may permit the limit values they fix to be exceeded in the case of the use of sludge on land which at the time of notification of this Directive is dedicated to the disposal of sludge but on which commercial food crops are being grown exclusively for animal consumption. Member States must inform the Commission of the number and type of sites concerned. They must also seek to ensure that there is no resulting hazard to human health or the environment.

<sup>(2)</sup> Member States may permit the limit values they fix to be exceeded in respect of these parameters on soil with a pH consistently higher than 7. The maximum authorized concentrations of these heavy metals must in no case exceed those values by more than 50 %. Member States must also seek to ensure that there is no resulting hazard to human health or the environment and in particular to ground water.

<sup>(3)</sup> It is not possible at this stage to fix limit values for chromium. The Council will fix these limit values later on the basis of proposals to be submitted by the Commission, within one year following notification of this Directive.



**▼B***ANNEX I B***LIMIT VALUES FOR HEAVY-METAL CONCENTRATIONS IN  
SLUDGE FOR USE IN AGRICULTURE****(mg/kg of dry matter)**

Parameters	Limit values
Cadmium	20 to 40
Copper	1 000 to 1 750
Nickel	300 to 400
Lead	750 to 1 200
Zinc	2 500 to 4 000
Mercury	16 to 25
Chromium <sup>(1)</sup>	—

<sup>(1)</sup> It is not possible at this stage to fix limit values for chromium. The Council will fix these limit values later on the basis of proposals to be submitted by the Commission within one year following notification of this Directive.

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## ANNEX I C

**LIMIT VALUES FOR AMOUNTS OF HEAVY METALS WHICH MAY  
BE ADDED ANNUALLY TO AGRICULTURAL LAND, BASED ON A  
10-YEAR AVERAGE****(kg/ha/yr)**

Parameters	Limit values <sup>(1)</sup>
Cadmium	0,15
Copper	12
Nickel	3
Lead	15
Zinc	30
Mercury	0,1
Chromium <sup>(2)</sup>	—

<sup>(1)</sup> Member States may permit these limit values to be exceeded in the case of the use of sludge on land which at the time of notification of this Directive is dedicated to the disposal of sludge but on which commercial food crops are being grown exclusively for animal consumption. Member States must inform the Commission of the number and type of sites concerned. They must also ensure that there is no resulting hazard to human health or the environment.

<sup>(2)</sup> It is not possible at this stage to fix limit values for chromium. The Council will fix these limit values later on the basis of proposals to be submitted by the Commission within one year following notification of this Directive.

*ANNEX II A***SLUDGE ANALYSIS**

1. As a rule, sludge must be analyzed at least every six months. Where changes occur in the characteristics of the waste water being treated, the frequency of the analyses must be increased. If the results of the analyses do not vary significantly over a full year, the sludge must be analyzed at least every 12 months.
2. In the case of sludge from the treatment plants referred to in Article 11, if a sludge analysis has not been carried out in the 12 months preceding the implementation, in each Member State, of this Directive, an analysis must be carried out within 12 months of such implementation, or, where appropriate, within six months of the decision authorizing the use in agriculture of sludge from such a plant. Member States shall decide on the frequency of further analyses on the basis of the results of the initial analysis, any changes in the nature of treated waste water and any other relevant factors.
3. Subject to the provisions of paragraph 4, analysis should cover the following parameters:
  - dry matter, organic matter,
  - pH,
  - nitrogen and phosphorus,
  - cadmium, copper, nickel, lead, zinc, mercury, chromium.
4. In the case of copper, zinc and chromium, where it has been shown, to the satisfaction of the competent authority of the Member State concerned that they are either not present at all or present only in negligible quantities in the waste water treated by the sewage plant, Member States shall decide on the frequency of the analyses to be carried out.

**▼B***ANNEX II B***SOIL ANALYSIS**

1. Whenever sludge other than sludge from the treatment plants referred to in Article 11 is used, Member States must first ensure that the heavy metal content of the soil does not exceed the limit values laid down in accordance with Annex IA. For this purpose, Member States shall decide what analyses to carry out, taking account of available scientific data on soil characteristics and homogeneity.
2. Member States shall decide on the frequency of further analyses, taking account of the metal content of the soil prior to the use of sludge, the quantity and composition of the sludge used and any other relevant factors.
3. Analysis should cover the following parameters:
  - pH,
  - cadmium, copper, nickel, lead, zinc, mercury and chromium.

**▼B***ANNEX II C***SAMPLING AND ANALYSIS METHODS****1. Soil sampling**

The representative soil samples for analysis should normally be made up by mixing together 25 core samples taken over an area not exceeding 5 hectares which is farmed for the same purpose.

The samples must be taken to a depth of 25 cm unless the depth of the surface soil is less than that value; however, the sampling depth in the latter case must not be less than 10 cm.

**2. Sludge sampling**

Sludge must be sampled after processing, but before delivery to the user, and should be representative of the sludge production.

**3. Methods of analysis**

Analysis for heavy metals must be carried out following strong acid digestion. The reference method of analysis must be that of atomic absorption spectrometry and the limit of detection for each metal should be no greater than 10 % of the appropriate limit value.