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THE EFFECTIVENESS OF STRUCTURAL  
MEASURES SPENDING ON **WASTE WATER  
TREATMENT** FOR THE 1994–99 AND  
2000–06 PROGRAMME PERIODS



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# THE EFFECTIVENESS OF STRUCTURAL MEASURES SPENDING ON WASTE WATER TREATMENT FOR THE 1994–99 AND 2000–06 PROGRAMME PERIODS

(pursuant to Article 248(4), second subparagraph, EC)

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# GLOSSARY

**Agglomeration:** Area where the population and/or economic activities are sufficiently concentrated for urban waste water to be collected and conducted to an urban waste water treatment plant or to a final discharge point.

**Cohesion Fund:** Financial instrument designed to strengthen economic and social cohesion by financing environment and transport projects in Member States with a per capita GNP of less than 90 % of the Community average. The Cohesion Fund was originally implemented in Spain, Greece, Ireland and Portugal. Since 1 January 2004 Ireland has no longer been eligible.

**Effectiveness:** Measure of the relationship between the results obtained and the objectives set.

**Effluent or discharged water:** Treated waste water discharged into river basin receiving waters.

**European Regional Development Fund (ERDF):** Financial instrument designed to promote economic and social cohesion between the regions of the EU. ERDF interventions are mainly implemented through operational programmes encompassing a large number of projects.

**Eutrophication:** The enrichment of water by nutrients especially compounds of nitrogen and phosphorus, causing an accelerated growth of algae leading to the reduction of water oxygen levels and to the disappearance of native aquatic plants, fish and other aquatic animal life.

**Independent checks:** Checks carried out by independent authorities (at national, regional or river basin level) in order to monitor the quality of the discharged water and the content of the sludge and of the soils where it is disposed.

**Normal areas:** Water body or section of water body not at risk of eutrophication.

**Operational programme:** A document approved by the Commission which takes the form of a coherent set of priorities comprising multiannual measures. The priorities may be implemented through recourse to one or more Structural Funds, or, alternatively, to other financial instruments and the European Investment Bank.

**Population equivalent (p.e.):** Quantitative expression of the pollution load of waste water in terms of the number of 'equivalent' people that would create a waste of the same strength. One p.e. corresponds to the pollution load of sewage generated by one inhabitant.

**Precautionary principle:** The precautionary principle states that if an action or policy might cause severe or irreversible harm to the public or to the environment, in the absence of a scientific consensus that harm would not ensue, the burden of proof falls on those who would advocate taking the action. In some legal systems, such as the law of the European Union, the precautionary principle is also a general and compulsory principle of law.

**Primary treatment:** Mechanical phase involving the initial separation from waste water of large sewage particles.

**Programme period:** The multiannual framework within which Structural Funds and Cohesion Fund expenditure is planned and implemented.

**River basin:** Area of land from which all surface run-off flows through a sequence of streams, rivers and, possibly, lakes into the sea at a single river mouth, estuary or delta.

**Secondary treatment:** Biological phase involving the treatment of waste water to eliminate biodegradable organic pollutants.

**Self-checks:** Checks carried out regularly by an operator, in the framework of the daily operation of an urban waste water treatment plant, to monitor the quality of the discharged water and the content of the sludge.

**Sensitive area:** Water body or section of water body at risk of eutrophication. The appropriate designation of sensitive areas is crucial as it dictates the type of waste water treatment that should be put in place to reduce eutrophication-inducing agents. In sensitive areas nitrogen and/or phosphorus should be removed.

**Sewage Sludge Directive:** 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).

**Structural Measures:** In the present report, interventions from the European Regional Development Fund (ERDF) and from the Cohesion Fund.

**Tertiary treatment:** Biological/chemical phase applied where necessary to reduce the concentration levels of nutrients in treated waste waters prior to their discharge into receiving waters at risk of eutrophication.



**Urban Waste Water Treatment Directive:** Council Directive 91/271/EEC of 21 May 1991 concerning urban waste water treatment (OJ L 135, 30.5.1991, p. 40).

**Urban Waste Water Treatment Plant:** Infrastructure providing a series of treatment processes aiming to reduce the level of pollution of urban agglomeration waste water received to an acceptable level before discharge into the receiving waters.

**Water Framework Directive:** Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (OJ L 327, 22.12.2000, p. 1).

# EXECUTIVE SUMMARY

## **I.**

The waste water and sewage sludge from urban agglomerations can affect the quality of Europe's lakes, rivers, coastal waters, soils and groundwaters. As a result the EU has adopted a series of directives and has also co-financed the building of urban waste water treatment plants through the Cohesion Fund and the ERDF. This has improved significantly the coverage rate of the urban population served by waste water treatment.

## **II.**

The Court's audit focused on Cohesion Fund and ERDF funded plants for the 1994–99 and 2000–06 programme periods, in Spain, Portugal, Greece and Ireland, which represented the majority of the spending in this area. The audit conclusions presented in this report are based on an examination of management and control systems at the Commission and on an assessment of the performance of 73 treatment plants. In addition, the disposal of sewage sludge produced as a by-product of waste water treatment and the role of the Commission in the area of waste water were also looked at.

## **III.**

The Court concluded that, in general, Structural Measures have contributed to an improvement in waste water treatment in the four Member States audited.

## **IV.**

Overall, treatment plants co-financed by Structural Measures were performing adequately. However, some were found to be operating below capacity and in a minority of cases EU requirements were not met with regard to effluent quality.

## EXECUTIVE SUMMARY

### **V.**

The Court found that more attention needed to be paid to ensuring that treatment plants are adequately connected to the sewage network and that the industrial waste water received by plants has been pre-treated as required.

### **VI.**

Concerning sewage sludge, the Court concluded that the majority of co-financed treatment plants, in the four Member States audited, disposed of sludge according to EU-encouraged methods of reuse; although a minority had chosen less sustainable non-reuse methods. In addition the Court identified some aspects with regard to monitoring of sludge disposal which could be improved.

### **VII.**

The current Sewage Sludge Directive dates from 1986 and therefore does not contain advances in the field made since then. Any revision of the directive should take into account all costs and all benefits of proposed new measures and potential impact on other EU policies.

### **VIII.**

As regards the role of the Commission, the Court is of the opinion that there could be more consistency in its review of grant applications, which would be facilitated through the development of internal guidelines and checklists for use in the appraisal process.

### **IX.**

Furthermore, the Court noted that there is a need for a better monitoring of outcomes by the Commission when examining final reports before any payment of the funding balance. Appropriate follow-up action should be taken with regard to the non-provision of required information or non-achievement of anticipated results.

### **X.**

Finally, the Court considered that maintaining the good ecological status of water bodies requires a stronger emphasis on the EU environmental principles of 'the polluter pays' and pollution reduction at source.

# INTRODUCTION

## ENVIRONMENTAL BACKGROUND

1. According to the Treaty, the Community shall contribute to preserving, protecting and improving the quality of the environment based on the precautionary principle and on the principles that preventive action should be taken, damage should be rectified at source and that the polluter pays<sup>1</sup>.

<sup>1</sup> Article 174 of the consolidated version of the Treaty establishing the European Community (OJ C 325, 24.12.2002, p. 1).

<sup>2</sup> Council Directive 91/271/EEC.

2. Urban agglomerations' waste water and sewage sludge can affect the quality of Europe's lakes, rivers, coastal waters and groundwaters, as well as its soils. The key relevant EU legislative instruments in the field are:

<sup>3</sup> Article 14 of Directive 91/271/EEC.

<sup>4</sup> Council Directive 86/278/EEC.

<sup>5</sup> Directive 2000/60/EC of the Parliament and of the Council.

- (a) the Urban Waste Water Treatment Directive<sup>2</sup> requiring Member States to ensure that, by 31 December 2000 or by 31 December 2005 depending on the size of the agglomeration concerned, all agglomerations be provided with collecting systems for urban waste water which should be subject to at least secondary treatment and tertiary treatment in the case of sensitive areas. Appropriate urban waste water treatment aims at monitoring and reducing to acceptable levels organic and inorganic pollutants including those potentially causing the eutrophication of nearby water bodies or posing health risks for bathers frequenting these waters; the directive also provides for the reuse of sludge arising from waste water treatment<sup>3</sup>;
- (b) the Sewage Sludge Directive<sup>4</sup> which specifies rules for the sampling and analysis of sludge and soil and sets limits for concentrations and maximum annual quantities of heavy metals which may be introduced into soil. The directive aims at regulating and encouraging the use of sewage sludge in agriculture in such a way as to avoid harm to vegetation, animals or humans;
- (c) the Water Framework Directive<sup>5</sup> which concerns the safeguarding and monitoring of the quality of river basin waters and their ecosystems. This Directive required the establishment of classification systems and a monitoring network by 2006, the publication of river basin management plans in 2009 and, as a rule, the attainment of environmental objectives by 2015.

3. A brief overview of the process of waste water treatment and sludge disposal is provided in a diagram entitled 'Urban Waste Water Treatment Environment', together with accompanying explanations in the **Annex**.

<sup>6</sup> Decision No 1600/2002/EC of the European Parliament and of the Council of 22 July 2002 laying down the Sixth Community Environment Action Programme (OJ L 242, 10.9.2002, p. 1).

4. According to the 'Sixth Community Environment Action Programme'<sup>6</sup>, the management of waste water is an EU priority for the period 2002–12.

<sup>7</sup> Article 5 of the consolidated version of the Treaty establishing the European Community says: 'only if and in so far as the objectives of the proposed action cannot be sufficiently achieved by the Member States and can therefore, by reason of the scale of effects of the proposed action, be better achieved by the Community'.

## EU GOVERNANCE AND CO-FINANCING

5. Environmental protection is an area of shared competence between the Member States and the Community, and therefore any action taken by the Community should be in accordance with the principle of subsidiarity<sup>7</sup>.

6. Directives on the environment apply across the Union. Compliance with their provisions can require investment projects which vary according to the level of waste water treatment required by the environmental situation of the water bodies where the effluent is discharged and by the type of equipment necessary (pumping stations, sludge dryers, etc.). They can vary from less than 10 million euro for a small agglomeration to more than 200 million euro for a major urban centre, with the cost per capita declining with the size of the plant due to economies of scale (see **Textbox 1**).

### TEXTBOX 1

#### EXAMPLES OF CO-FINANCED PROJECTS VISITED BY THE COURT

In Spain, a project was co-financed by the Cohesion Fund to serve four villages with a population of 10 000 inhabitants. It included an urban waste water treatment plant providing secondary and tertiary level of treatment, 18 kilometres of pipes and six pumping stations. The cost of the project was 5,5 million euro, with an EU grant of 4,3 million euro.

In Portugal, the cost of a new treatment plant co-financed by the Cohesion Fund was 22,8 million euro. This plant, designed to serve a population of 250 000 inhabitants with a secondary level of treatment and disinfection of the water, received an EU grant of 19,4 million euro.

In Greece, the Cohesion Fund co-financed a substantial upgrading of a treatment plant for a city of 3,7 million inhabitants from that of simple primary to secondary and tertiary treatment. The cost of the project was 202,2 million euro, with an EU grant of 135,0 million euro.

- 7.** Costs for the construction of treatment plants are eligible for Structural Measures assistance. In Objective 1 regions the level of grant may attain 85 %<sup>8</sup>. EU financial support totalled 10,6 billion euro for the 2000–06 programme period<sup>9</sup>, with four Member States (Spain, Portugal, Greece and Ireland) accounting for more than 50 % of expenditure. A total of 13,9 billion euro is allocated for the 2007–13 programme period, with the 12 new EU Member States accounting for 9,1 billion euro.
- 8.** Two Directorates-General in the European Commission have a significant role in the approval and follow-up of waste water and sewage sludge treatment projects: Directorate-General for the Environment (DG ENV) and Directorate-General for Regional Policy (DG REGIO).
- 9.** DG ENV is responsible for EU environmental policy in the field of waste water treatment. It is required to follow up the performance of treatment plants in terms of the quality of water discharged and the disposal of sludge, and also to launch infringement procedures when required.
- 10.** DG REGIO is responsible for the EU budget in the area of regional policy through shared management with Member States. Treatment plants are co-financed under this policy through two financial instruments: the Cohesion Fund and the ERDF<sup>10</sup>.
- 11.** The Commission examines all applications in respect of Cohesion Fund projects and ERDF major projects<sup>11</sup> submitted by Member States, to ensure that they have been completed correctly and are in compliance with EU directives. Guidance intended to aid Member States with their submission of applications for assistance is provided by the Commission in its 'Guide to the Cohesion Fund 2000–06'. DG REGIO's role is to examine the quality of the individual projects to be financed, consulting other Directorates-General as necessary (particularly DG ENV).
- <sup>8</sup> Objective 1 promotes the development and structural adjustment of regions whose development was lagging behind the average (per capita GDP less than 75 % of the EU average). Two thirds of Structural Fund operations were related to Objective 1 with almost 20 % of the Union's total population concerned by this Objective. For the programme period 2000–06, the maximum rate of grant in these regions is 75 % for ERDF projects and 85 % for Cohesion Fund projects.
- <sup>9</sup> Information is not available at the Commission for the programme period 1994–99 as data concerning the ERDF were, for that period, only available at Member State level.
- <sup>10</sup> The co-financing of treatment plants was also approved for the candidate countries under the Pre-Accession Structural Instrument (ISPA). These projects were converted into Cohesion Fund projects at the time of the accession.
- <sup>11</sup> For the 1994–99 programme period, 'major projects' were 'those the total cost of which taken into account in determining the amount of Community assistance is, as a general rule, greater than ECU 25 million for infrastructure investments or greater than ECU 15 million for productive investments'. For the 2000–06 programme period, the definition of 'major projects' covered projects 'whose total cost taken into account in determining the contribution of the Funds exceeded 50 million euro'. For the period 2007–13, the threshold for environmental projects is 25 million euro.

- 12.** The decision to co-finance a project establishes the amount granted and the conditions which must be satisfied. After completion of Cohesion Fund projects, in order to receive the balance of the grant, the beneficiary must submit a final report describing the work carried out and providing an initial assessment as to whether the anticipated results have been achieved<sup>12</sup>. For ERDF major projects, specific final reports are not required by the regulation but reports on the operational programmes in which the major projects are included must contain a chapter providing separate information on them.
- 13.** As regards the other ERDF projects, the Commission's role is limited to the assessment and approval of the operational programmes, rather than individual projects.

<sup>12</sup> Council Regulation (EC) No 1164/94 of 16 May 1994 establishing a Cohesion Fund (OJ L 130, 25.5.1994, p. 1), as amended by Regulation (EC) No 1265/1999 (OJ L 161, 26.6.1999, p. 62).

<sup>13</sup> For the four Member States visited, more than 50 % of the financial resources necessary for implementing urban waste water treatment had been provided by the EU.

### COVERAGE RATE OF AGGLOMERATIONS BY WASTE WATER TREATMENT

- 14.** Partly as a result of the entering into force of the Urban Waste Water Treatment Directive and the significant EU financial support<sup>13</sup>, there has been a significant increase in the coverage rate of the urban population served by secondary and tertiary treatment capabilities (see definition in the **Annex**). This is particularly marked in the four Member States who received more than 50 % of EU expenditure for implementing urban waste water treatment for the 2000–06 programme period (**Tables 1** and **2**).

TABLE 1

**EVOLUTION OF PERCENTAGE OF POPULATION OF URBAN AGGLOMERATIONS SERVED BY TREATMENT PLANTS PROVIDING SECONDARY TREATMENT**

Member State	Start of 1994–99 programme period	End of 2000–06 programme period
Ireland <sup>1</sup>	20 % (1994)	87 % (2006)
Spain <sup>2</sup>	41 % (1995)	77 % (2005)
Portugal <sup>3</sup>	32 % (1994)	80 % (2006)
Greece <sup>4</sup>	< 20 % (1994)	85 % (2005)

- 1 Environmental Protection Agency (EPA) — Office of Environmental Enforcement, Urban Waste Water Discharges in Ireland — Reports for the Years 2002–03 and 2004–05. 2006 figures provided by Department of the Environment, Heritage and Local Government.
- 2 For 1995 data, report prepared according to Article 16 of the Urban Waste Water Treatment Directive, sent by Spain to the Commission (October 2004) and, for 2005, estimate received from the Ministry of the Environment.
- 3 Strategic Plan for Water and Waste Water Treatment (2007–13).
- 4 Ministry of Environment — Central Water Agency estimate.

TABLE 2

**EVOLUTION OF PERCENTAGE OF POPULATION OF URBAN AGGLOMERATIONS LOCATED IN SENSITIVE AREAS SERVED BY TREATMENT PLANTS PROVIDING SECONDARY AND TERTIARY TREATMENT**

Member State	Start of 1994–99 programme period (1995) <sup>1</sup>	End of 2000–06 programme period
Ireland	2 %	8 % (2006) <sup>2</sup>
Spain	3 %	84 % (2005) <sup>3</sup>
Portugal	0 %	63 % (2005) <sup>4</sup>
Greece	6 %	55 % (2006) <sup>5</sup>

- 1 OECD Environmental Data (Compendium 2006).
- 2 For 2006, Environmental Protection Agency (EPA) and for 2009 the Department of Environment has estimated that the percentage will increase to 80 %.
- 3 Ministry of Environment.
- 4 Instituto da Água I. P. (INAG I. P.) has estimated that the percentage will increase to 78 % in 2008.
- 5 Ministry of Environment — Central Water Agency. The figure had increased to 97 % by 2007.



# AUDIT SCOPE AND APPROACH

- 15.** The main objective of the audit was to assess the effectiveness of Structural Measures spending on waste water treatment for the 1994–99 and 2000–06 programme periods.
- 16.** The Court addressed the following questions:

  - (a) Do EU co-financed treatment plants achieve an adequate performance in the treatment of waste water?
  - (b) Is the sludge produced by the treatment plants being used appropriately?
  - (c) Is the Commission fulfilling its role in relation to project selection, monitoring of outcomes through its analysis of final reports and promotion of environmental principles?
- 17.** The audit was carried out at the European Commission and in four Member States: Spain, Portugal, Greece and Ireland. The total Community expenditure on waste water treatment projects for these Member States was 5,2 billion euro for the programme period 1994–99 and 5,9 billion euro for the 2000–06 period. The audit was conducted from May 2007 to March 2008.
- 18.** The audit was based on an assessment of the performance of a sample of 73 operating treatment plants co-financed during the relevant programme periods.
- 19.** Commission project approval, monitoring and follow-up procedures were examined. In the Member States, the Court interviewed representatives from the various local, regional and national authorities charged with the design, selection, operation and monitoring of treatment plants. The Court visited 26 projects (**Table 3**), accompanied by independent experts knowledgeable in the areas of treatment plant operation, maintenance and control. A further 47 treatment plants were subject to desk checks. In order to identify and compare benchmarks and best practices in the field, a review of standards of some non-EU countries was undertaken (USA, Switzerland, Canada, Australia and Japan).

TABLE 3

**WASTE WATER TREATMENT PLANTS VISITED AS PART OF THE COURT'S AUDIT:  
BY LOCATION AND FUNDING SOURCE**

	Cohesion Fund	ERDF	Total
Spain	5	1	6
Portugal	5	1	6
Greece	6	0	6
Ireland	6	2	8
Total	22	4	26

# OBSERVATIONS

## DO EU CO-FINANCED TREATMENT PLANTS ACHIEVE AN ADEQUATE LEVEL OF PERFORMANCE IN THE TREATMENT OF WASTE WATER?

### BACKGROUND

- 20.** The purpose of the treatment of domestic and pre-treated industrial waters is to reduce pollutants to an acceptable level which can then be safely absorbed by the receiving water bodies. The quality of the effluent is monitored through the taking of water samples. <sup>14</sup>Two treatment plants operated at a capacity of 35 %, four at around 40 % and one at 45 %.
- 21.** The Court examined:
- (a) whether the treatment plants operated at an appropriate capacity;
  - (b) whether the quality of the effluent produced was acceptable;
  - (c) whether the treatment plants were adequately monitored with regard to performance.

### MOST OF THE TREATMENT PLANTS OPERATED AT AN APPROPRIATE CAPACITY...

- 22.** Of the treatment plants visited, 18 out of 26 were deemed to be operating satisfactorily with regard to capacity, having an utilisation rate above 50 %. In these cases, there was an adequate connection of households and industrial users to the treatment plant.

### ... BUT A NUMBER OF TREATMENT PLANTS OPERATED WELL BELOW CAPACITY...

- 23.** Plants operating at less than 50 % capacity can be considered as being underutilised. In the Court's sample, seven plants were operating as such and their underutilisation can be explained as follows<sup>14</sup>:

- (a) six of the seven cases of underutilisation resulted from problems in completing the network, with many households and industrial users remaining unconnected to the treatment plants despite the plants being five years or more in operation. As a result, not all of the waste water produced in the area was treated;
- (b) the other plant was operating at lower than planned capacity due to the loss of local industries, which led to a drastic reduction in the quantity of water received for treatment.

<sup>15</sup> Council Directive 91/271/EEC, Annex I, Tables 1 and 2 establish requirements for discharges concerning biochemical oxygen demand (BOD5), chemical oxygen demand (COD), total suspended solids (TSS) for normal areas, and in addition, for sensitive areas, total phosphorus (TP) and/or total nitrogen (TN) (see the *Annex*).

### ... AND ONE TREATMENT PLANT HAD INSUFFICIENT CAPACITY

- 24.** One plant was operating at full capacity due to the unexpectedly rapid economic growth of the region concerned. As a result the treatment plant did not have enough capacity to handle its waste water load at the time of the Court's visit. Expansion works for this plant are planned for 2009–10, leaving it currently unable to properly treat all waste water received.

### A LARGE MAJORITY OF THE TREATMENT PLANTS PRODUCED EFFLUENT MEETING EU REQUIREMENTS

- 25.** The Court assessed the quality of the water discharged by the 73 treatment plants selected against the requirements of the Urban Waste Water Treatment Directive<sup>15</sup>. The directive was in turn compared with regulations in existence in non-EU countries with a similar level of economic and social development. In 64 cases the quality of the discharged water met EU requirements and *Table 4* summarises the results.

TABLE 4

**PERFORMANCE OF TREATMENT PLANTS IN THE AUDIT SAMPLE WITH REGARD TO EU EFFLUENT QUALITY REQUIREMENTS**

	Treatment plants audited	EU requirements clearly met	EU requirements borderline met	EU requirements not met
Spain	19	9	7	3
Ireland	18	12	5	1
Portugal	18	8	6	4
Greece	18	12	5	1
Total	73	41	23	9
%	100 %	56,2 %	31,5 %	12,3 %

PICTURES 1-4

**EXAMPLES OF TREATMENT PLANTS MEETING EU REQUIREMENTS**



Picture 1: Psyttalia treatment plant — Greece



Picture 2: Febros treatment plant — Portugal



Picture 3: León treatment plant — Spain



Picture 4: Drogheda treatment plant — Ireland

- 26.** As presented in **Table 4**, in nine cases the quality of the discharged water did not meet EU requirements and the following problems were noted:
- (a) industrial waste water should normally be pre-treated before being discharged into the municipal sewage system to avoid problems in the performance of the treatment plant. In four treatment plants not meeting EU requirements, the main problems were due to the reception by the plants of water from industrial sources which had not been fully pre-treated and in some cases the operators had not been informed as to the composition of the industrial waste water they were receiving (see **Textbox 2**);
  - (b) some treatment plants were being operated by local authorities lacking adequate resources and expertise and with no mechanisms in place to be informed of best practice;
  - (c) in other cases poor performance resulted from failure to adequately remove the eutrophication-inducing nutrients due to a lack of appropriate nutrient removal equipment.

**TEXTBOX 2****EXAMPLES OF INADEQUATE PRE-TREATMENT OF INDUSTRIAL WASTE WATER**

In Spain, operators of two of the three treatment plants not meeting standards, noted in their 'Monthly Operating Reports' that industries were channelling untreated waste water to their plants which had an adverse impact on performance. For one of these two plants, 74 of the 93 self-checks carried out during 2006 deviated by more than 100 % from the limits established in the Urban Waste Water Treatment Directive.

In Portugal, in two of the four treatment plants not meeting EU requirements, industries were discharging directly into the municipal sewage system without carrying out appropriate pre-treatment. The situation was known to the operators and furthermore had been noted in the reports of the independent body charged with monitoring treatment plant performance.

### **EFFLUENT QUALITY MONITORING: GENERALLY ACCEPTABLE PERFORMANCE DATA BUT SOME OPPORTUNITIES FOR IMPROVEMENT**

- 27.** Generally, for the 26 treatment plants visited, the self-checks carried out by the plant operator were in accordance with the standards set out in the Urban Waste Water Treatment Directive with regard to their frequency and the sampling methods used. However, some weaknesses were identified especially at smaller plants:

<sup>16</sup> Annex I.D of the directive 91/271/EEC.

<sup>17</sup> Directive 86/278/EEC and Directive 91/271/EEC.

- (a) in one case, the frequency of the self-checks was insufficient (five self-checks were carried out in 2006 instead of the 12 required);
- (b) in three cases the sampling method used was not in compliance with the directive (grab sampling was used while the directive provides for 24h-composite or flow-proportional sampling).

- 28.** During the audit a number of good practices were observed which were additional to the requirements of the directive:

- (a) operators in treatment plants with a capacity above 50 000 p.e. were performing more self-checks than the 24 required by the directive<sup>16</sup>. In the 14 such plants visited, the number of samples taken per year varied from 38 to 365;
- (b) three of the four Member States visited operate a system of discharge licences establishing the discharged water requirements for each treatment plant (although some of the treatment plants visited in those Member States were operating without licences or with out of date licences). The fourth Member State launched its licensing system in 2008.

### **IS THE SLUDGE PRODUCED BY THE TREATMENT PLANTS BEING USED APPROPRIATELY?**

#### **BACKGROUND**

- 29.** The treatment of waste water results in the discharge of effluent and the production of sewage sludge. The EU encourages its use as a fertiliser<sup>17</sup>, as treated sewage sludge is a good source of phosphorus, nitrogen and potassium. Such use of the sludge makes economic sense for the farmer, being a good use of available resources whilst at the same time being beneficial for the soil. However, sewage sludge may also contain harmful contaminants which have to be kept to an acceptable level for the sludge to be used or disposed of safely.

**30.** The Court examined:

- (a) whether the sludge was disposed of safely, with the EU encouraging<sup>18</sup> its safe reuse in agriculture and energy generation through incineration, with disposal in municipal landfills being acceptable although recognised as being the least sustainable method;
- (b) whether when used in agriculture, the sludge and the soil had safe levels of certain substances considered hazardous;
- (c) whether monitoring at operating plants and Member States provided adequate assurance that the sewage sludge was being disposed of safely.

<sup>18</sup> Council Directive 75/442/EEC of 15 July 1975 on waste (OJ L 194, 25.7.1975, p. 39).

**TWO THIRDS OF THE TREATMENT PLANTS AUDITED  
DISPOSED OF THE SEWAGE SLUDGE IN ACCORDANCE  
WITH EU RECOMMENDED PRACTICES**

- 31.** Of the 73 treatment plants in the audit sample, of those following EU recommended reuse methods, 47 chose agriculture and one plant selected the generation of energy through incineration (see **Table 5**).

TABLE 5

**DISPOSAL OF THE SEWAGE SLUDGE PRODUCED BY THE TREATMENT PLANTS  
IN THE AUDIT SAMPLE**

	EU recommended reuse methods		Non-reuse methods			Total
	Land application	Incineration	Municipal landfills	Treatment plant on-site	Other	
Spain	16	0	2	0	1	19
Ireland	17	0	1	0	0	18
Portugal	14	0	1	3	0	18
Greece	0	1	14	2	1	18
<b>Total</b>	<b>47</b>	<b>1</b>	<b>18</b>	<b>5</b>	<b>2</b>	<b>73</b>



- 32.** Non-reuse methods were practised at the other 25 treatment plants for various reasons:
- (a) although Greece is currently developing a national plan to deal with the issue of sewage sludge disposal, at the time of the audit neither national nor regional plans were in place and 14 of the 18 Greek treatment plants audited disposed of their sewage sludge in municipal landfills;
  - (b) in Greece and Portugal, some treatment plants do not have a viable strategy for sludge disposal, particularly those municipally operated. This has led to on-site storage and, in one case, dumping in an abandoned mine. One large treatment plant in Greece did not have a valid contract for the sludge disposal and, as a result, 13 450 tonnes of sludge were each year stored on-site (**Picture 6**).

## PICTURES 5-6

## EXAMPLES OF DISPOSAL OF SEWAGE SLUDGE



Picture 5: EU-encouraged practice of reuse on agricultural lands



Picture 6: Poor practice: storage on-site at treatment plant visited

- 33.** For the Member States visited, the Court’s review of data on the disposal of sewage sludge indicated that there had been a noticeable increase in reuse of sewage sludge as encouraged by the EU (**Table 6** and **Textbox 3**).

TABLE 6

#### EVOLUTION OF PERCENTAGE OF REUSE OF TREATMENT PLANT SEWAGE SLUDGE IN ACCORDANCE WITH EU RECOMMENDED PRACTICES<sup>1</sup>

Member State	Start of 1994–99 programme period	End of 2000–06 programme period	Reuse method
Ireland	12 % / 15 % (1994)	76 % / 83 % (2005)	Agriculture/all land
Spain	46 % (1997)	66 % (2003)	Agriculture
Portugal	30 % (1995)	42 % (2005)	Agriculture
Greece	0 % (1997)	0 % (2005) / 50 % (mid-07) <sup>2</sup>	Energy (incineration)

<sup>1</sup> Reports on sewage sludge that Member States prepare according to Article 17 of the Sewage Sludge Directive.

<sup>2</sup> Estimate. Ministry of Environment.

TEXTBOX 3

#### EXAMPLE OF HOW ONE MEMBER STATE ENCOURAGED EU RECOMMENDED PRACTICE

The performance achieved by Ireland was attributable in part to its implementation of the Sewage Sludge Directive through the development and application of guidelines identifying best practice for sewage sludge treatment and disposal. One guideline focused on the preparation of effective sludge management plans for local authorities, whereas two others dealt with the safe disposal of sludge on agricultural lands, including a requirement for the use of a ‘Nutrient Management Plan’ for each farmer.

### SATISFACTORY RESULTS AGAINST SEWAGE SLUDGE DIRECTIVE REQUIREMENTS

- 34.** For the treatment plants audited on-site in the three Member States applying sludge to land, lab tests carried out on heavy metal concentrations in sewage sludge and soils, prior to the application of the sludge, gave results which were in compliance with the maximum limits required by the Sewage Sludge Directive. Checks were carried out for other compounds, such as polychlorinated biphenyls (PCBs), although not required by the directive (see **Textbox 4**).

### REVISION OF THE DIRECTIVE?

- 35.** Although the Court found that the requirements of the Sewage Sludge Directive were being satisfactorily adhered to, as the current directive was adopted in 1986, it does not take into account subsequent developments in techniques and methods of sludge treatment and disposal. For example the directive does not require testing for organic contaminants such as PCBs, or pathogens such as *E. coli*, whereas some EU Member States set maximum concentration levels for organic contaminants in their national regulations and certain non-EU countries have set standards aimed at reducing the harmful effects of pathogens in sludge. In addition, there is no mention in the directive of other popular land applications such as forestry.

#### TEXTBOX 4

### EXAMPLES OF CHECKS FOR OTHER COMPOUNDS IN SEWAGE SLUDGE

In Ireland, three of eight treatment plants visited periodically tested for fluoride, arsenic, selenium and magnesium. Some plants also tested polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs).

In Portugal, since 2006, sludge produced by treatment plants receiving industrial waters has to be checked for organic compounds and dioxins. This had been carried out at four of the six treatment plants visited.

- 36.** If a revision is deemed necessary, it is likely that new limits for various substances would be more stringent than those found in the current directive. However, in other instances, there may be an opportunity, in the light of research carried out since the adoption of the 1986 directive, to relax certain limits which were thought prudent in the past. There may also be a need to instigate tests for contaminants not mentioned in the current directive.

#### **SLUDGE DISPOSAL MONITORING: SOME OPPORTUNITIES FOR IMPROVEMENT AT OPERATING PLANTS AND MONITORING BODIES OF THE MEMBER STATES**

- 37.** The Court's review of sludge quality testing and recording for the operating plants in the sample indicated that the frequency of sampling and the choice of sampling method for the sewage sludge testing were generally in accordance with the Sewage Sludge Directive, even if some weaknesses were identified concerning the number of tests carried out.
- 38.** In Member States, the Court noted that:
- (a) at the various levels, the authority responsible for monitoring sewage sludge were often not able to indicate the quantity of sludge produced, its content or how it was disposed of;
  - (b) as different units were sometimes responsible for monitoring agricultural and non-agricultural sludge disposal separately, there was a lack of overview with regard to the situation of each treatment plant as a whole.

### **IS THE COMMISSION FULFILLING ITS ROLE?**

#### **BACKGROUND**

- 39.** The approval and follow-up of waste water treatment projects co-financed by the EU involves two Directorates-General of the European Commission: DG REGIO and DG ENV. For the Cohesion Fund and ERDF major projects, the Commission's role in the appraisal of grant applications and the decision process relates to individual projects, whereas for smaller ERDF projects, its intervention is at the level of the operational programme (paragraphs 8 to 13).

- 40.** For Cohesion Fund and ERDF major projects, the Court examined whether the Commission:
- (a) checked in a consistent manner the environmental information contained in the grant applications;
  - (b) reviewed the outcomes achieved by approved projects before paying the balance of the grant;
  - (c) ensured that Member States applied the EU environmental principles that pollution should be reduced at source and the polluter should pay.

#### NEED FOR CONSISTENCY IN PROJECT EXAMINATION

- 41.** For the Commission to ensure that all grant applicants are treated equally and that all aspects of the applications are covered, an appropriate and systematically applied framework including internal guidelines and checklists is essential. During the course of its audit, the Court noted an absence of such guidelines and checklists.
- 42.** The Commission's Cohesion Fund 2000–06 Guide stipulated certain key documents and information which had to be included with grant applications. Such information was not always included with the applications reviewed by the Court and the use of checklists could have prevented this.
- 43.** In its review of the 22 treatment plants visited on the spot and co-financed by the Cohesion Fund the Court noted:
- (a) while almost all applications and Commission decisions include targets for the quality of discharged water and the volume of waste water to be treated, they contain little information about the nature of sewage sludge disposal (only indicated in eight applications for assistance and six granting decisions) or about the quality of sewage sludge (referred to in only two applications for assistance and one granting decision);
  - (b) an absence of quantified receiving water quality performance indicators in almost all applications for assistance and corresponding Commission decisions (and this was confirmed by the findings of an *ex post* evaluation carried out for the Commission).

- 44.** Indeed, the Court has noted that the assessment of whether projects have met their objectives can be affected by shortcomings in aid applications, in particular concerning anticipated effects and indicators<sup>19</sup>.
- 45.** A more rigorous examination of projects at application stage could have identified and helped solve certain problems noted during the course of the audit:
- (a) inadequate treatment plant quality in sensitive areas due to a lack of appropriate nutrient removal equipment (paragraph 26);
  - (b) inadequate disposal of sludge, with some large treatment plants accumulating its sewage sludge on-site (paragraph 32).

<sup>19</sup>The most recent examples were observed by the Court in its Special Report No 1/2008 concerning the procedures for the preliminary examination and evaluation of major investment projects for the 1994–99 and 2000–06 programme periods (OJ C 81, 1.4.2008, p. 1).

#### NEED FOR BETTER MONITORING OF OUTCOMES

- 46.** Before paying the balance of the grant of Cohesion Fund projects, a final report containing in particular an assessment of whether anticipated results have been achieved has to be submitted to the Commission. If the final report is not sent to the Commission within 18 months of the final date in the granting decision, the remaining balance of the payment should, according to the relevant EU legislation, be cancelled.
- 47.** In its audit of the final reports of the 22 treatment plants co-financed by the Cohesion Fund and visited by the Court, it was noted that only six final reports provided data on the quality of the discharged water, only one provided data related to measured water quality improvement and only three indicated the method of sewage sludge disposal.
- 48.** The Court concludes that the Commission is not in a position to properly evaluate final reports without being in possession of fundamental and key information such as referred to in paragraph 47. Given such lack of information, suspension or cancellation of the balance of a payment will only occur on the non-submission of a report, rather than following an assessment as to whether anticipated results have actually been achieved.

## MORE CONSIDERATION OF EU ENVIRONMENTAL PRINCIPLES REQUIRED

- 49.** Preserving the good ecological status of water bodies<sup>20</sup> requires not only the satisfactory treatment of waste water at individual plant level but also application of the EU environmental principles that pollution should be reduced at source and the polluter should pay.
- 50.** A Commission report asserts<sup>21</sup> that two of the main sources of eutrophication of fresh waters by urban agglomerations are phosphate-based domestic laundry detergents and human metabolic waste. Concerns over the contribution of phosphate-based laundry detergents have led most Member States to move towards phosphate-free detergents.
- 51.** Other reports<sup>22</sup> conclude that the provision of tertiary treatment alone may not in itself be sufficient in avoiding eutrophication without a move away from phosphate-based detergents.
- 52.** The Commission has studied the potential environmental benefits for Member States of such a move away from phosphate-based detergents and concluded that 24 of the 25<sup>23</sup> studied would benefit in varying degrees<sup>24</sup>. Amongst the factors taken into account for each Member State were the annual consumption of detergent phosphates, the provision of tertiary water treatment and the extent of concern over eutrophication.
- 53.** The Commission has recognised the need for appropriate action and in the report referred to in paragraph 50, it stated that a decision on whether restrictions on phosphates in detergents would be taken if justified and that an impact assessment and eventual presentation of a legislative proposal would follow if considered appropriate.
- 54.** Concerning the 'polluter pays' principle, the Water Framework Directive requires by 2010 the adoption of water-pricing policies providing incentives for the efficient use of water resources and recovery of costs.
- <sup>20</sup>The good ecological status is defined in the Water Framework Directive based on three groups of elements: biological quality elements, hydromorphological quality elements and physico-chemical quality elements (Article 2 and Annex V).
- <sup>21</sup>Report from the Commission to the Council and the European Parliament pursuant to Article 16 of Regulation (EC) No 648/2004 of the European Parliament and of the Council of 31 March 2004 on detergents, concerning the use of phosphates / COM(2007) 234 final — Brussels, 4 May 2007.
- <sup>22</sup>EU Environment Directorate — Final Report on Phosphates and Alternative Detergent Builders / WRc Ref: UC 4011 / June 2002 pages 120, 121 and 125, UNDP/GEF report at Danube River and MARE/HELCOM project on the Baltic Sea area.
- <sup>23</sup>Bulgaria and Romania were not taken into account in this study.
- <sup>24</sup>The Commission reported that two of the countries which had received large amounts of assistance from the EU in support of waste water treatment investment, and which were visited in this audit, were less than 50 % phosphate-free in laundry detergents.

- 55.** When assessing a grant application, the Commission is required to verify compliance with the 'polluter pays' principle and this may influence the rate of assistance granted<sup>25</sup>. However, no specific benchmarks are provided against which to assess the proposed tariff rates in the application. The Court noted that tariff rates were never included in the granting decision and often not in the final reports, thereby making difficult an assessment of financial sustainability.
- 56.** The Court's review of the tariffs applied by the plants visited showed that generally tariffs are too low to cover operating costs (see **Textbox 5**).

<sup>25</sup> EC DG Regio 'Cohesion Fund 2000-06 Manual of Procedures' (Version 2006-09) — page 21.

#### TEXTBOX 5

#### EXAMPLES OF TARIFFS APPLIED BY THE TREATMENT PLANTS VISITED

The tariffs applied by the treatment plants visited in Spain, Portugal and Greece varied significantly (e.g. ranging for a quantity of water over 20 m<sup>3</sup> from 0,079 euro/m<sup>3</sup> to 1,17 euro/m<sup>3</sup>).

Ireland does not directly charge domestic users for their use of water and waste water services, though it does charge commercial and industrial users of water and waste water services.



# CONCLUSIONS AND RECOMMENDATIONS

- 57.** The overall conclusion of the Court is that Structural Measures have contributed to the improvement of waste water treatment in the four Member States audited.

## WASTE WATER TREATMENT

- 58.** As regards the performance of waste water treatment plants, the Court found that in general those plants co-financed by Structural Measures perform at an adequate level (paragraphs 22 and 25).

- 59.** However:

- (a) seven of the 26 plants were found to be operating below capacity due, in six cases, to a failure to connect all potential domestic and industrial users to the treatment plants and in one case to the loss of local industries (paragraphs 23 and 24);
- (b) the quality of the effluent did not meet EU requirements in nine out of 73 cases due to inadequately pre-treated industrial waste water being discharged into the sewage network, a lack of expertise on the part of some local authorities and a lack of adequate equipment or technology in areas designated as sensitive (paragraph 26).

- 60.**

### THE COURT THEREFORE RECOMMENDS THAT:

- (a) Member States should ensure that sufficient thought is given to the connection of newly constructed treatment plants to the sewage network;
- (b) Member States should, in order to improve the quality of the water discharged, pay greater attention to the adequate pre-treatment of industrial waste water and to promote the sharing of best practice amongst operators.

## SEWAGE SLUDGE TREATMENT AND DISPOSAL

**61.** As regards the plants' treatment and disposal of sewage sludge, the Court found that two thirds of the treatment plants co-financed by Structural Measures reuse the sludge resulting from the treatment of waste water following methods recommended in EU directives, with almost all of them preferring its reuse on agricultural land (paragraph 31).

**62.** However:

- (a) in 25 out of 73 plants unsustainable non-reuse methods were found, such as on-site storage (paragraph 32);
- (b) in three out of four Member States, for some plants, the relevant authorities were not able to indicate the quantity of sludge produced, its content or how it was disposed of (paragraph 38);
- (c) although the Court found that the requirements of the Sewage Sludge Directive were being adhered to, developments in sludge treatment and disposal subsequent to 1986 are not taken account of in EU legislation, though some Member States apply more stringent standards (paragraphs 35 and 36).

**63.**

### THE COURT THEREFORE RECOMMENDS THAT:

- (a) Member States should, before submitting the project for co-financing, ensure that urban waste water treatment plants have a strategy for the disposal of sewage sludge;
- (b) Member States should ensure that their databases on sewage sludge contains information for each plant on the quantity of sludge produced, its content and method of disposal;
- (c) the Commission should consider whether the time is now appropriate for the revision of the Sewage Sludge Directive. Any revision should take into account the costs and benefits of proposing new measures as well as the need to maintain a balance with other EU policies.

## EFFECTIVENESS OF THE ROLE OF THE COMMISSION

- 64.** As regards the role played by the Commission in relation to its approval and follow up of Cohesion Fund projects and ERDF major projects, the Court noted the following significant weaknesses:
- (a) the Commission approved projects which did not include key information in the application for assistance as required by the Guide to the Cohesion Fund (e.g. performance objectives in relation to sludge disposal and quality of receiving waters). Such information facilitates the assessment of achieved results to be included in the project final report (paragraphs 41 to 45);
  - (b) individual Cohesion Fund project final reports often do not contain results concerning the quality of the discharged water, the receiving waters and the quality and the nature of the disposal of the sewage sludge. Without such information the Commission is not in a position to carry out the necessary evaluation of final reports before payment of the final balance (paragraphs 46 to 48).
- 65.** As regards the consideration given by the Commission relating to EU environmental principles, the Court noted the following:
- (a) a number of studies have indicated possible benefits on the environment to be gained by moving to non-phosphate-based detergents. Assessment of this issue should continue to be balanced, with an adequate component of cost-benefit analysis (paragraphs 50 to 53);
  - (b) the Commission did not always take the 'polluter-pays' principle sufficiently into account, as the Court's review found that the tariffs applied were generally too low to cover operating costs. Furthermore, tariff rates were not often included in final reports, making difficult any assessment of financial sustainability (paragraphs 54 to 56).

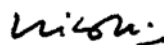
66.

THE COURT THEREFORE RECOMMENDS  
THAT THE COMMISSION SHOULD:

- (a) require that information allowing the setting of performance targets, in such key areas as quality of water discharged, quality of receiving water bodies, volume of water to be treated and intended method of sludge disposal should be included in grant applications and systematically checked as part of the project appraisal process. The establishment of appropriate internal guidelines and checklists for use by desk officers would facilitate this;
- (b) encourage Member States to assess the achievement of the anticipated results at project level as set out in the application for assistance, noting that for the period 2007–13 no final report is required to be submitted to the Commission in respect of Cohesion Fund projects and ERDF major projects;
- (c) assess whether a further move away from phosphate-based detergents is justifiable on the basis of costs and benefits to the EU citizen;
- (d) ensure that the financial sustainability of treatment plant projects is considered at the application approval stage and pertinent information such as proposed tariffs is given due consideration.

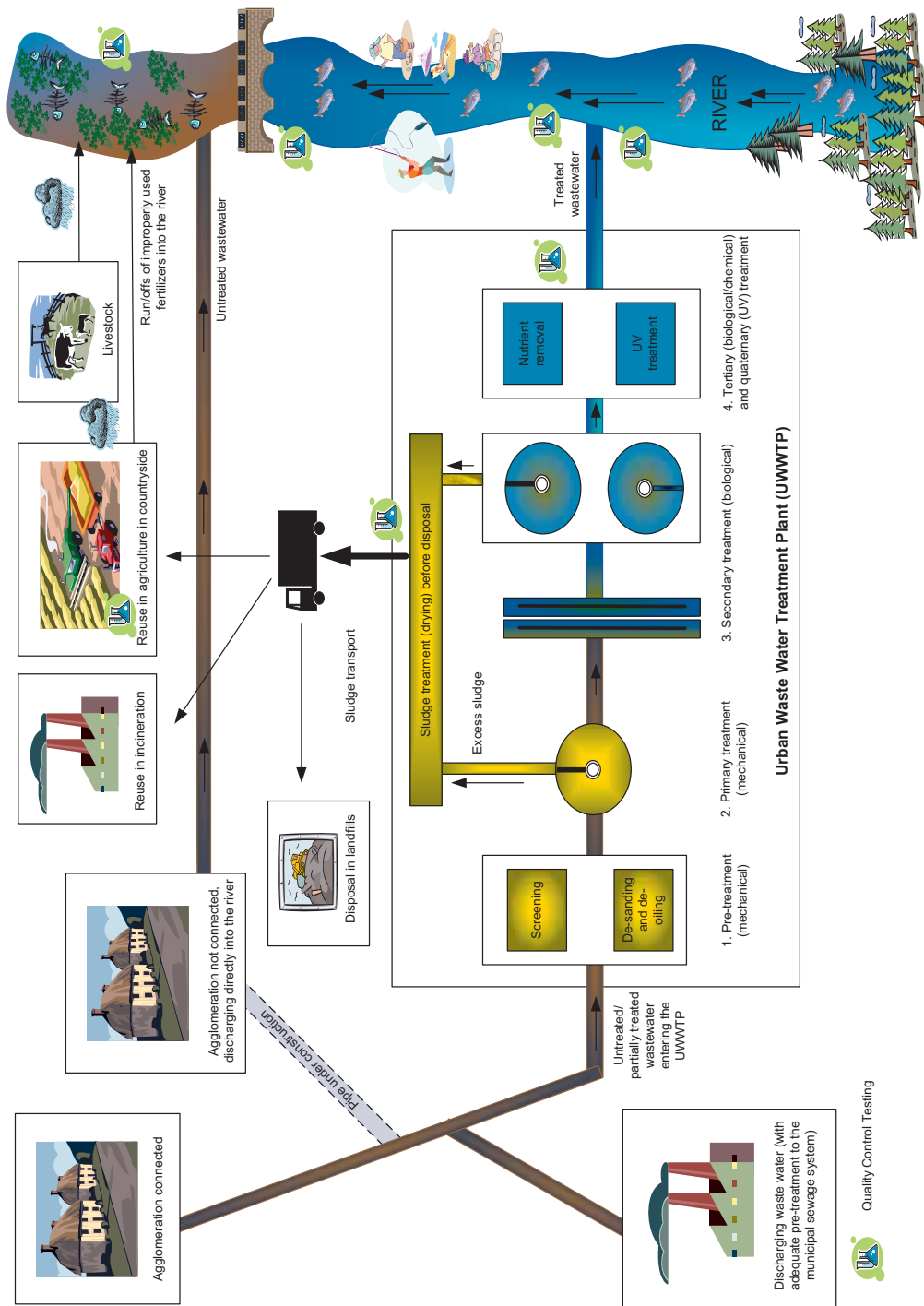
This report was adopted by the Court of Auditors in Luxembourg at its meeting of 18 and 19 March 2009.

*For the Court of Auditors*



Vítor Manuel da Silva Caldeira  
*President*

URBAN WASTE WATER TREATMENT ENVIRONMENT



## COMPLEMENTARY NOTES TO DIAGRAM

### DIFFERENT WASTE WATER AND SEWAGE TREATMENT STAGES

Waste water is collected through the urban sewage pipe network and pumped to the urban waste water treatment plant (UWWTP), where it undergoes several stages of treatment before its discharge into the waterways of the river basin.

#### Waste water pre-treatment

This mechanical phase involves the removal of the largest pieces of waste through screening (e.g. paper, plastic ...) as well as of sand and oil through other processes.

#### Waste water primary treatment

This mechanical phase involves the initial separation from waste water of large sewage particles, which settle at the bottom of the tank. These particles are then scraped and channelled as sewage sludge for subsequent treatment and reuse.

#### Waste water secondary treatment

This biological phase involves the treatment of waste water to eliminate biodegradable organic pollutants, as measured in BOD<sub>5</sub>, COD and TSS concentration levels (see Quality Parameters).

The most common type of secondary treatment involves the use of purifying micro-organisms which break down and consume the biodegradable sewage content. This in turn leads to the separation and collection of sewage sludge similar to that described in the waste water primary treatment phase.

#### Waste water tertiary treatment

This biological/chemical phase is applied where necessary, to reduce the concentration levels of nutrients in treated waste waters prior to their discharge into river basin waterways at risk of eutrophication.

Eutrophication arises from the explosive growth of algae induced by nutrients, which leads to the reduction of oxygen levels in water resulting in the disappearance of native marine plants, fish and other aquatic animal life.

The two major eutrophication-inducing nutrients are phosphorus (in relation to fresh water) and nitrogen (in relation to salt waters).

#### Waste water quaternary treatment

This radiation phase is applied where necessary, to eliminate harmful bacteria (*E. coli*) to humans using nearby waters, commonly for bathing. This treatment usually involves the disinfection of treated sewage using ultraviolet light.

#### Sewage sludge treatment

Sewage sludge is generally dewatered to a 20 % water content in a mud state known as 'biosludge' and can be further dried to a 1 % water content in a dry pellet state known as 'biofert' prior shipment for disposal.

Biosludge and biofert may be reused in land applications, provided contaminant levels are not exceeded. In addition biofert may be reused in energy generation through incineration.

The SSD also requires the periodic testing of agricultural soils for acceptable heavy metals concentrations prior to the application of sewage sludge.

### QUALITY CONTROL PARAMETERS MANDATED BY EU DIRECTIVES

#### Treated waste water (Urban Waste Water Treatment Directive)

The following parameters are tested in treated waste water prior leaving the UWWTP for discharge into the receiving waters of the river basin:

#### Biological Oxygen Demand (BOD)

Quantity of oxygen consumed by micro-organisms to eliminate biodegradable organic and mineral matter contained in water. BOD5 is conventionally used to measure oxygen consumption in terms of mg O<sub>2</sub>/l after 5 days. The higher the BOD5 value, the greater the consumption of oxygen by micro-organisms and the greater the pollution.

#### Chemical Oxygen Demand (COD)

Quantity of oxygen consumed to oxidise, by chemical means, the organic and mineral matter present in water. COD therefore includes both biodegradable matter characterised by BOD5 and non-biodegradable oxidisable matter. This parameter is also expressed in mg O<sub>2</sub>/l.

#### Total Suspended Solids (TSS)

Quantity of mineral and organic particles suspended in water which can be captured on a porosity filter. This parameter is also expressed in mg/l.

#### Total Nitrogen (TN) and Total Phosphorus (TP)

Quantity of eutrophication-inducing nutrients contained in water. This parameter is also expressed in mg/l.

#### Treated sewage sludge (Sewage Sludge Directive)

The following heavy metals are tested for concentration levels expressed in mg/kg of dry matter in sludge prior to application on agricultural soils:

cadmium, copper, nickel, lead, zinc, mercury and chromium.

#### River basin water quality (Water Framework Directive)

The EU has developed sophisticated testing and monitoring classifications and monitoring systems allowing for categorising Member States' waters into five ecological status levels, of which two, good and high, are acceptable for meeting EU clean water policy objectives.



# REPLY OF THE COMMISSION

## EXECUTIVE SUMMARY

### III.

The Commission underlines that waste water treatment was a key investment priority of the Cohesion Fund and the ERDF in the four audited Member States.

### IV.

Underutilisation of some treatment plants is sometimes caused by time lags in the construction of the waste water systems, associated with significant changes in economic activity that could not be foreseen. In addition, projects may include treatment of waste water sources beyond the requirements of the Urban Waste Water Treatment Directive. In such cases, a future-oriented design of the treatment plant can be cost-effective, but it might lead temporarily to the treatment plants operating below capacity.

### V.

The Commission agrees that investments in this sector need to rely on a long-term planning at local/regional level, and financial resources should include the Cohesion Policy funds, but they need to be complemented by other sources.

### VI.

Reuse of sewage sludge is in many cases limited by the quality of the sludge, geographical conditions or economic considerations.

### VII.

The Commission is working on a revision of the Sewage Sludge Directive, based on the development of a comprehensive impact assessment of options and their costs and benefits.

## REPLY OF THE COMMISSION

### VIII.

Member States have the primary responsibility for the selection, implementation and monitoring of the co-financed projects.

For the period 2007–13, the Commission has developed a checklist for internal use during major water and wastewater projects appraisal, for assessing consistency with the environmental *acquis* and policy. However, only major projects are now subject to a Commission decision (projects in this sector — above 25 million euro).

### IX.

Before paying the balance to any Cohesion Fund or major project the Commission endeavours to check that the conditions of funding have been fulfilled and where necessary requests clarifications from the beneficiary. The Commission will consider how best to achieve the Court's recommendations.

For projects approved during 2007–13, in the wastewater sector, a series of output indicators are included in the Commission's decisions for co-financing (i.e. level of treatment, capacity of the plant).

### X.

During 2000–06, the Commission made efforts in promoting the 'polluter pays' principle, by issuing an indicative paper on the application of the principle in the frame of Cohesion Policy. It underlined the importance of this element and requested Member States to commit themselves to a strengthened application of the principle. From 2010 onwards, the polluter pays principle will become operational, under the provisions of the Water Framework Directive.

### INTRODUCTION

#### 2.

##### (c)

It should be noted that the provisions of the Water Framework Directive were not applicable for the audited projects and period (1994–2006).

For projects prepared after 2009, they will become applicable.

#### 8.

The Commission recalls that Member States have the primary responsibility for the selection, implementation and monitoring of the projects.

#### 9.

The Commission is regularly checking compliance with the Urban Waste Water Treatment Directive. The four Implementation Reports issued by the Commission by the end of 2007 list horizontal infringement procedures commenced against Member States, inter alia against the audited states, and judgments by the Court of Justice.

#### 11–12.

For the 2007–13 period, the regulation enables the Commission to assess and approve only major projects (above 25 million euro for environmental projects), co-financed by either the Cohesion Fund or the ERDF. For these projects, there will not be project final reports to be approved by the Commission.

For the period audited, the Commission examined the quality of individual projects submitted by Member States only for Cohesion Fund projects and major ERDF projects.

## REPLY OF THE COMMISSION

For both periods, the Commission's review of projects is based on socio-economic factors, the coherence and consistency of the project, the degree of maturity and deliverability, using techniques such as cost-benefit analysis and internal rate of return. The Commission carries out the final evaluation based on the fact that the project is operational and in conformity with the initial decision. The proper subsequent operation of the co-funded treatment plant is not in the scope of the evaluation of Cohesion Policy but falls under the general Community legislation.

### OBSERVATIONS

#### 23.

Underutilisation of some treatment plants is sometimes caused by time lags in the construction of the waste water systems, associated with significant changes in economic activity that could not be foreseen. In addition, projects may include treatment of waste water sources beyond the requirements of the directive. In such cases, a future-oriented design of the treatment plant can be cost-effective, but it might lead temporarily to the treatment plants operating below capacity.

The Commission agrees that investments in this sector need to rely on a long-term planning at local/regional level, and financial resources should include the Cohesion Policy funds, which need to be complemented by other sources.

#### 24.

The unexpected growth or socio-economic changes in this specific region is among the risks affecting project development.

#### 25.

Overall, the co-funded waste water treatment plants have led to an improvement of the management of the waste waters in the specific regions, and to a reduction of their impact on the environment.

#### 26.

The Commission takes note of the facts and will make further enquiries. It underlines, however, that Member States are responsible for the operation of the treatment plants and their compliance with Community legislation.

##### (a)

Industrial waste waters pre-treatment should indeed be in place when the urban waste water treatment plant starts operation. Thus, at the application stage when the Commission examines the project, the beneficiary should demonstrate that industrial waste waters are either correctly pre-treated or subject to an action plan for solving the matter.

The industrial wastewater discharges should also be subject to a permitting procedure, as enshrined in the Urban Waste Water Treatment Directive (Article 11).

##### (b)

Projects can include technical assistance to improve beneficiaries' capacities.

##### (c)

The Commission has been active in implementing the requirement for nutrient removal, both by informing (letter to Member States of 3 July 2003) and by undertaking legal infringement procedures (for inadequate effluent quality from treatment plants and/or for inadequate designation of sensitive areas), leading to judgments by the Court of Justice (see 2007 Implementation Report).

#### 27.

##### (a)

The Commission has requested monitoring and performance data on treatment plants for the forthcoming fifth Implementation Report for the Urban Waste Water Treatment Directive.

## REPLY OF THE COMMISSION

### 32.

Reuse of sewage sludge is in many cases limited by the quality of the sludge, geographical conditions or economic considerations.

#### (a)

The Commission explains the disposal of sewage sludge in municipal landfills at the time of the audit with the industries' lack of interest in reusing sludge, combined with public reactions.

#### (b)

For the large treatment plant in Greece the Commission co-finances a project on the extension and completion of this waste water treatment plant. It comprises the construction of a sludge drying unit and aims at further utilisation of dried sludge. The project was approved in 2006 and will be finalised end of 2009.

### 34.

As regards sewage sludge quality checks under the Sewage Sludge Directive, certain Member States have established lower maximum limits than those in the directive. It may be necessary to check additional parameters, depending on the types of waste water discharged into the sewer (i.e. industrial waste water).

### 35.

The Commission is working on a revision of the 1986 Sewage Sludge Directive, based on the development of a comprehensive impact assessment of options and their costs and benefits.

The tentative timing is: preparation of an impact assessment for a possible legislative proposal in 2009; adoption of a possible legislative proposal in 2010.

### 36.

The impact assessment for the revision of the Sewage Sludge Directive has to examine the environmental, economic and social risks connected with the land spreading of sewage sludge. The tightening of existing limit values for heavy metals and the introduction of further limit values for organic and other contaminants are among the main options that will be considered.

### 39.

The Commission refers to its replies given on points 8, 9 and 12.

### 41.

For the period 2007–13, the Commission has developed a checklist for internal use during major water and waste water projects appraisal, for assessing consistency with the environmental *acquis* and policy.

### 42.

A guide as well as a checklist for major projects is not binding for Member States but only indicative.

For the period 2007–13, the Commission organises regular internal training sessions on appraisal of water and waste water projects.

### 43.

#### (a)

For the period 2007–13, project beneficiaries are expected to present the final destination of sludge in the application, which implies a preliminary estimation of the sludge quality and quantity. However, for greenfield investments, the quality of sewage sludge may not be known in detail.

## REPLY OF THE COMMISSION

**(b)**

For the audited period (1994–2006), water quality performance indicators existed at EU level only for certain waters (i.e. drinking water abstraction, bathing waters). Hence the indicators contained in the Guide to Cohesion Fund 2000–06 could not be applied for all projects. Comprehensive performance indicators have only been introduced through the Water Framework Directive, with objectives to be defined by December 2009 and to be achieved, as a rule, by December 2015.

**45.**

The Commission underlines that it neither has the legal basis nor the necessary resources to go into more detail when assessing project applications.

**(a)**

The Commission has in numerous cases taken Member States to the Court of Justice, including the four Member States audited, for inadequate effluent quality from treatment plant and/or for inadequate designation of sensitive areas, and will continue to do so.

**(b)**

As regards the inadequate disposal of sludge at a large plant in Greece, the Commission was aware of the problem and asked the relevant Member State to work out a solution, which was implemented with the support of the Commission (see point 32(b)).

**47.**

The Commission carries out the final evaluation based on the fact that the project is operational and in conformity with the initial decision. The proper subsequent operation of the co-funded treatment plant is not in the scope of the evaluation of cohesion policy. Furthermore, there is no legal requirement for Member States to routinely provide information regarding quality of the discharged water, of the receiving waters and the quality and the nature of the disposal of the sewage sludge.

**48.**

A recently introduced IT tool should make the upcoming closure procedure easier and more transparent. A check is done on a case-by-case basis, especially when a project has experienced difficulties. Suspension or cancellation of the balance of payment may also occur following the reception and analysis of the final report by the Commission.

**49.**

The Commission refers to its comments on points 43(b) and 55.

**53.**

The Commission is currently assessing the need for a revision of the detergents legislation, based on the development of a comprehensive impact assessment of options and their costs and benefits.

**55.**

During 2000–06, the Commission made efforts in promoting the ‘polluter pays’ principle, by issuing an indicative paper on the application of the principle and a guide on cost–benefit analysis (2002). These tools have asked Member States to commit themselves to a strengthened application of the ‘polluter pays’ and cost-recovery principles. From 2010 onwards, these principles will become operational, under the provisions of the Water Framework Directive.

## REPLY OF THE COMMISSION

### CONCLUSIONS AND RECOMMENDATIONS

**59.**

**(a)**

Underutilisation of some treatment plants is sometimes caused by time lags in the construction of the waste water systems, associated with significant changes in economic activity that could not be foreseen. In addition, projects may include treatment of waste water sources beyond the requirements of the directive. In such cases, a future-oriented design of the treatment plant can be cost-effective, but it might lead temporarily to the treatment plants operating below capacity.

**(b)**

The Commission underlines that Member States are responsible for the operation of the treatment plants and their compliance with Community legislation. The Commission has in numerous cases taken Member States to the Court of Justice, including the four Member States audited, for inadequate effluent quality from treatment plants and/or for inadequate designation of sensitive areas, and will continue to do so.

**60.**

**(a)**

The Commission agrees that investments in this sector need to rely on a long-term planning at local/regional level, and financial resources should include the cohesion policy funds, which need to be complemented by other sources.

**(b)**

Instruments for regulating the industrial waste water discharges are enshrined in the Urban Waste Water Treatment Directive (Article 11), and should be applied by Member States.

**62.**

**(a)**

Reuse of sewage sludge is in many cases limited by the quality of the sludge, geographical conditions or economic considerations.

**63.**

**(a)**

The Commission agrees that projects in this sector should indicate the strategy for the sewage sludge management. For new projects, submitted during 2007–13, this element is being checked.

**(b)**

In 2007, Member States were asked to provide data related to the sewage sludge production, for the preparation of the fifth Implementation Report of the Urban Waste Water Treatment Directive. The requirement to report has encouraged Member States to establish national databases.

**(c)**

The Commission is working on a revision of the Sewage Sludge Directive, based on the development of a comprehensive impact assessment of options and their costs and benefits.

**64.**

The Commission recalls that Member States have the primary responsibility for the selection, implementation and monitoring of the projects.

**(a)**

The Commission has neither the legal basis nor the necessary resources to undertake a detailed assessment. However, for the period 2007–13, the appraisal of major projects has been streamlined, and without fulfilling minimum requirements, projects cannot be co-financed (i.e. information on sludge management strategy). This is being addressed through the use of checklists and specific training.

## REPLY OF THE COMMISSION

**(b)**

In relation to the period 2007–13, under both the Cohesion Fund and the ERDF, only major urban waste water treatment projects will be subject to individual Commission decisions. The Commission will not, in general, have the same level of detail in relation to the implementation and finalisation of major projects as in the past.

**65.**

**(b)**

During 2000–06, the Commission made efforts in promoting the ‘polluter pays’ principle, by issuing an indicative paper on the application of the principle and underlining its importance in the Guide to Cohesion Policy. The guide to cost–benefit analysis (2002) provided also Member States with relevant guidance to progress on cost recovery. However, since those guidances were not legally binding, it could only ask Member States to commit themselves to a strengthened application of the principle.

**66.**

**(a)**

For the period 2007–13, the Commission has developed a checklist for internal use during major water and waste water projects appraisal, for assessing consistency with the environmental *acquis* and policy, including among others the quality of the waters discharged, and sludge management. Also, a number of output indicators are included in the individual project Commission’s decisions (i.e. level of treatment, capacity of the plant).

**(c)**

The Commission is currently assessing the need for a revision of detergents legislation, based on the development of a comprehensive impact assessment of options and their costs and benefits.

**(d)**

The new guide to cost–benefit analysis of investment projects (June 2008) highlights the central role of the ‘polluter pays’ principle as well as the total cost recovery for waste water projects. It is now supported by the legal requirements of the Water Framework Directive and will lead to a better water pricing based on cost recovery by 2010.





European Court of Auditors

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THE WASTE WATER AND SEWAGE SLUDGE FROM URBAN AGGLOMERATIONS CAN AFFECT THE QUALITY OF EUROPE'S LAKES, RIVERS, COSTAL WATERS, GROUNDWATERS AND SOILS. AS A RESULT, THE EU HAS ADOPTED A SERIES OF DIRECTIVES AND HAS ALSO CO-FINANCED THE BUILDING OF URBAN WASTE WATER TREATMENT PLANTS. IN THIS REPORT THE COURT ANALYSES WHETHER EU CO-FINANCED TREATMENT PLANTS ACHIEVE AN ADEQUATE LEVEL OF PERFORMANCE IN THE TREATMENT OF WASTE WATER AND WHETHER THE SLUDGE PRODUCED BY THE PLANTS IS BEING USED APPROPRIATELY. THE ROLE OF THE COMMISSION IS ALSO EXAMINED.



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