



Urban Waste Water Discharges in Ireland

with population equivalents greater than 500 persons

A Report for the Years 2002 and 2003

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with population equivalents greater than 500 persons**

**A REPORT
FOR THE YEARS 2002 AND 2003**

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Glossary

Agglomeration:	An 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.
Agriculture:	The growing of all types of commercial food crops, including food crops for stock-rearing purposes.
Appropriate treatment:	Treatment of urban waste water by any process and/or disposal system which after discharge allows the receiving waters to meet the relevant quality objectives and the relevant provisions of the Urban Waste Water Treatment Directive and of other Community Directives.
BOD₅:	Biochemical Oxygen Demand (BOD ₅) means the amount of dissolved oxygen taken up by bacteria while oxidising organic matter in a sample, measured after 5 days incubation in the dark at 20°C. The Regulations stipulate that this test is carried out on a homogenised, unfiltered, undecanted sample to which a nitrification inhibitor has been added. The addition of the nitrification inhibitor is important as the oxidation of ammonia to nitrate can increase the rate of oxygen use and give an increased result.
COD:	Chemical Oxygen Demand means the amount of oxidising agent potassium dichromate needed to oxidise the organic matter present in a sample. Other chemicals are also added to suppress the effects of interfering substances such as chloride. In general, the BOD ₅ will only account for some 65% of the total carbonaceous oxygen demand in urban waste waters. The COD test which achieves virtually complete oxidation returns a result in a short time (2-4 hours) and often a correlation to the BOD ₅ test can be established for municipal waste waters once a sufficient number of analyses have been carried out.
Domestic waste water:	Waste water from residential settlements and services which originates predominately from the human metabolism and from household activities.
Industrial waste water:	Any waste water which is discharged from premises used for carrying on any trade or industry, other than domestic waste water and run-off rain water.
Normal areas:	Areas which have not been specified in the third schedule of the Urban Waste Water Treatment Regulations, 2001 (S.I. 254 of 2001), Urban Waste Water Treatment (Amendment) Regulations, 2004 (S.I. 440 of 2004) and such other areas as may be identified pursuant to article 5 of the Urban Waste Water Treatment Directive.
Nutrient reduction:	Reduction of total phosphorus and/or total nitrogen by chemical and/or biological processes to levels specified in Part II of the second schedule of the Urban Waste Water Treatment Regulations, 2001 (S.I. 254 of 2001).
Primary treatment:	Treatment by a physical and/or chemical process involving settlement of suspended solids. Typically, such treatment will reduce BOD ₅ of the incoming waste water by at least 20% and total suspended solids by at least 50% (Urban Waste Water Treatment Directive, 91/271/EEC).
Total nitrogen:	The sum of kjeldahl nitrogen (organic nitrogen plus ammonia (NH ₃)), nitrate-

nitrogen (NO_3) and nitrite-nitrogen (NO_2). In contrast to phosphorus, nitrogen can be a limiting nutrient in marine environments subject to eutrophication. Notwithstanding the eutrophication issue, significant discharges of ammonia can be toxic to aquatic life.

Total phosphorus:	The sum of ortho-phosphates, polyphosphates and organically bound phosphates. This element is one of the most meaningful parameters in the assessment of eutrophication, particularly in lakes and freshwaters where it is generally the limiting nutrient.
Total suspended solids:	The quantity of suspended solids present in the outflow from a waste water treatment plant is a good indicator of the plant's performance. The solids include both organic and inorganic matter.
Secondary treatment:	Treatment of urban waste water by a process generally involving biological treatment with a secondary settlement or other process in which the requirements established in Part 1 of the second schedule Urban Waste Water Treatment Regulations, 2001 (S.I. 254 of 2001) are respected.
Sensitive areas:	Those areas specified in the third schedule of the Urban Waste Water Treatment Regulations, 2001 (S.I. 254 of 2001), Urban Waste Water Treatment (Amendment) Regulations, 2004 (S.I. 440 of 2004) and such other areas as may be identified pursuant to article 5 of the Urban Waste Water Treatment Directive.
Sludge:	<ol style="list-style-type: none">1) 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.2) Residual sludge from septic tanks and other similar installations for the treatment of sewage.3) Residual sludge from sewage plants other than those referred to in paragraph 1) and 2).
Urban waste water:	Domestic waste water or a mixture of domestic waste water with industrial waste water and/or run-off rain water.

Abbreviations

EPA	Environmental Protection Agency
BOD	Biochemical Oxygen Demand
BOD ₅	5-day biochemical oxygen demand
COD	Chemical Oxygen Demand
DOEHLG	Department of the Environment Heritage and Local Government
d/s	Downstream
EEC	European Economic Community
EU	European Union
IPC	Integrated Pollution Control
mg/kgDM	Milligrams per kilogram of dry matter
mg/l	Milligrams per litre
o-P	Ortho phosphate
p.e.	Population equivalent(s)
R.B.D.	River Basin District
S.I.	Statutory Instrument
tds	Tonnes of dry solids
Total P	Total phosphorous
TSS	Total suspended solids
u/s	Upstream
UWWT	Urban waste water treatment
WFD	Water Framework Directive

Executive Summary

This is the fifth biennial report by the Environmental Protection Agency (EPA) on the quality of urban waste water discharges and sewage sludges. It is prepared under section 61 of the EPA Act, 1992 and section 51 of the Waste Management Act, 1996. The report has been prepared from data submitted by local authorities, for the years 2002/2003 and audits conducted by the EPA, during 2003 and 2004.

The report establishes that there were 443 agglomerations with a population equivalent (p.e.) greater than 500 during the reporting period and collectively they represent a total population equivalent (p.e.) of 5,802,424 persons. This is an increase of 309,086 p.e. on that reported for 2001. This increase is due to improved monitoring of population equivalents at existing treatment plants and more accurate assessments of p.e. for agglomerations now connected to new treatment plants. Previously it was only possible to use best estimates for agglomerations without treatment plants.

The report concludes that 18% of waste water arisings received no treatment, 13% received preliminary treatment, 2% received primary treatment, 58% received secondary treatment, and 9% received nutrient reduction in addition to secondary treatment. Almost all of Ireland's urban waste water, irrespective of the level of treatment, is discharged to estuaries and freshwaters.

Of the forty agglomerations of 15,000 p.e. or greater only twenty seven of these had secondary treatment installed and operational by the end of the reporting period. Of the thirteen agglomerations that did not have the required facilities installed by the end of 2003, 4 were connected to treatment plants by the end of 2004. Nine treatment plants are due to commence construction in 2005.

The report advises that all local authorities review their sampling programmes for urban waste water treatment plants and ensure the frequencies comply with at least the minimum set out in the Urban Waste Water Regulations. The report highlights the fact that the principal sampling protocol presently favoured by local authorities, grab sampling, is not the method specified in the Regulations and **not** sufficient to establish compliance.

Auditing of local authorities and urban waste water treatment plants, which commenced in 1998, continued during the reporting period. During the reporting period, 24 local authorities were audited. These audits highlighted examples of good practice as well as deficiencies that require correction. This report provides examples of both. In future years, the EPA will be focussing its auditing effort on local authorities with plants that consistently demonstrate poor performance in relation to the quality of effluent discharged.

Poor performance of any waste water treatment plant is a cause for concern as even smaller plants can have a significant impact on water quality in the waters to which their effluents discharge. A key recommendation of the report is therefore that all local authorities should review the operation, maintenance and management of urban waste water treatment plants in their functional areas and prepare corrective action programmes for plants that are in breach of the standards. Priority should be given to implementing corrective action programmes at plants that are having a demonstrably negative impact on the waters to which they discharge.

During 2003 there were 42,298 tonnes (dry solids) of sewage sludge generated with 63% of this reused in agriculture and 35% disposed to landfill and not put to any beneficial use. The analysis of sewage sludge disposal routes returned by the sanitary authorities indicates that disposal of sewage sludge to the marine environment has ceased in accordance with the provisions of The Dumping at Sea Act, 1981.

Urban Waste Water Discharges in Ireland:
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1. INTRODUCTION

The Environmental Protection Agency (EPA) is required under Section 61(3) of the Environmental Protection Agency Act, 1992, to report on a biennial basis on the quality of effluents being discharged from treatment plants, sewers or drainage pipes which are vested in, controlled or used by sanitary authorities. This report provides an analysis of the treatment of waste water during 2002 and 2003, quality of discharges, sewage sludge and commentary on trends for the period 1998 to 2001. The report is based on questionnaires returned from Sanitary Authorities on an annual basis.

The Urban Waste Water Treatment (UWWT) Regulations, 2001 (S.I. 254 of 2001), which incorporate and update the Environmental Protection Agency Act, 1992 (Urban Waste Water Treatment) Regulations, 1994 as amended in 1999, place a responsibility on local authorities to provide treatment of urban waste water, to monitor discharges from agglomerations (communities) and to transmit the results of such monitoring to the EPA. The Urban Waste Water Treatment (UWWT) Regulations, 2001 (S.I. 254 of 2001) designated 30 water bodies for protection in addition to the 10 sensitive areas designated in 1994, for the purpose of tackling eutrophication of Irish waters. In addition, the Urban Waste Water Treatment (Amendment) Regulations, 2004 (S.I. 440 of 2004) designate a further two water bodies as sensitive.

The legislation (Urban Waste Water Regulations, 1994) required agglomerations with a population equivalent greater than 10,000 discharging into sensitive waters or into the catchment of sensitive waters to have nutrient reduction facilities in addition to secondary treatment by 31 December 1998. Nutrient reduction is also required by 31 May 2008 for discharges to sensitive waters defined in the Urban Waste Water Regulations 2001 and Urban Waste Water (Amendment) Regulations 2004, from waste water treatment plants serving a population equivalent of greater than 10,000. However, as noted in previous reports the discharges from the majority of agglomerations (i.e. population equivalents between 2,000 and 15,000) are required under the Regulations to have the necessary treatment facilities in place by 31 December 2005. Agglomerations with population equivalents greater than 15,000 were required to have secondary treatment in place by 31 December 2000. Existing treatment plants that fall within the scope of Regulations are also obliged to comply with the standards set by the Regulations.

The use of sewage sludge in agriculture is regulated by the Waste Management Act, 1996, Waste Management (Use of Sewage Sludge in Agriculture) Regulations, S.I. No. 148 of 1998 and Waste Management (Use of Sewage Sludge in Agriculture) (Amendment) Regulations, S.I. No. 267 of 2001. The Act and the Regulations place a responsibility on local authorities to plan and control the disposal and/or reuse of sewage sludge within their functional area. The quantity of sewage sludge generated in each county is reported, along with the main recovery or disposal routes used. The Regulations [Waste Management (Use of Sewage Sludge in Agriculture) (Amendment) Regulations, S.I. No. 267 of 2001 and Waste Management (Use of Sewage Sludge in Agriculture) Regulations, S.I. No. 148 of 1998] require that sludge is managed in accordance with a nutrient management plan and these Regulations also set limit values for the amounts of specified heavy metals which may be added annually to land used in agriculture, based on a ten year average. This report provides an overview of quantities of sewage sludge produced along with the main recovery or disposal routes used. Heavy metal concentrations in sludges used in agriculture are also examined.

During the reporting period the EPA carried out a number of audits of local authorities to assess their management of urban waste water and level of compliance with the Urban Waste Water Regulations and the Use of Sewage Sludge in Agriculture Regulations. The report provides an analysis of the findings and provides recommendations which should be adopted by the local authorities.

2. Regulatory Framework

2.1. THE URBAN WASTE WATER TREATMENT REGULATIONS, 2001 AND 2004

The Urban Waste Water Treatment Regulations, 2001 (S.I. No. 254 of 2001), were made by the Minister for the Environment on 14 June 2001 and amended on 15 July 2004. The Regulations give further effect to the provisions of EU Council Directive 91/271/EEC of 21 May 1991, as amended concerning urban waste water treatment, and Directive 2000/60/EC of 23 October 2000 – The Water Framework Directive. The Regulations designate an additional 32 water bodies as sensitive to eutrophication based on reports by the Environmental Protection Agency. The schedules of the Regulations, which include the parameters to be monitored, and the frequency of monitoring are reproduced in Appendix A of this report.

The main requirements of the Regulations are summarised below:

- scheduled provision of waste water collecting systems - depending on the size of the agglomeration and on the type of water body to which the waste water is discharged;
- scheduled provision of waste water treatment plants - depending on the size of the agglomeration and on the type of water body to which the waste water is discharged;
- provision for industrial waste water which enters collecting systems and urban waste water treatment plants to receive any pre-treatment that is required to protect the health of staff, the environment and the fabric and integrity of plant; and
- monitoring by sanitary authorities of discharges from waste water treatment plants and the transmission of results to the EPA.

The type of treatment facilities required (by the Regulations) for individual agglomerations depend on:

- the size of the agglomeration;
- the type of receiving water body (freshwater, estuarine or coastal water); and
- whether the receiving water body is sensitive (or not), as defined by the Regulations.

The requirements of the Regulations in respect of treatment plants are summarised in Figure 2-1

The Urban Waste Water Treatment (UWWT) Regulations, 2001 (S.I. 254 of 2001) revoke the Environmental Protection Agency Act, 1992 (Urban Waste Water Treatment) Regulations, 1994 (S.I. No. 419 of 1994) as amended by S.I. 208 of 1999. The consolidated Regulations in addition to the designation of 30 additional water bodies as sensitive areas also included new provisions in article 4(4)(b). The new provisions allowed discretion to a local authority not to provide nutrient reduction in discharges to estuaries, bays or coastal waters where it is satisfied that such reduction will have no effect on the level of eutrophication in the receiving water. This provision has since been removed by Urban Waste Water Treatment (Amendment) Regulations, 2004 with the deletion of article 4(4)(b).

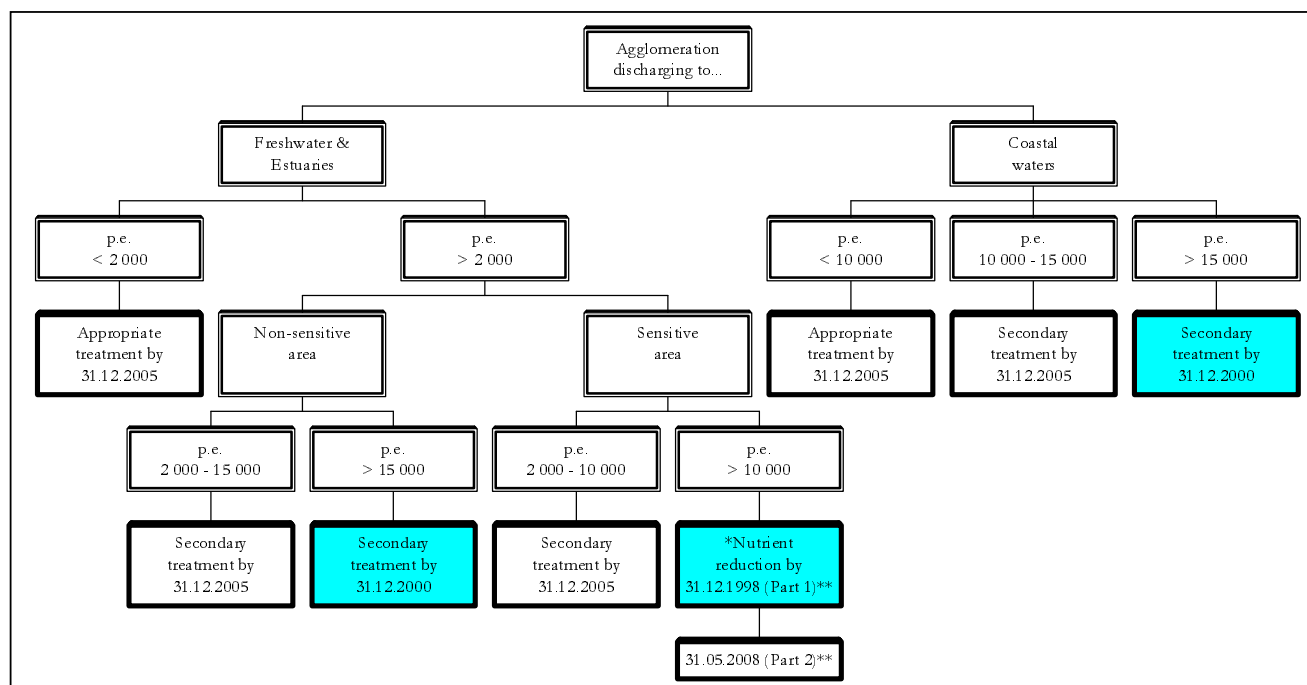


Figure 2-1. Treatment Plant Requirements

* In addition to secondary treatment

** See Appendix A For Part 1 and Part 2 of Third Schedule

2.1.1. Treatment Facilities

The Urban Waste Water Treatment (UWWT) Regulations 2001, in general, prescribe secondary treatment for all waste water discharges. Secondary treatment is defined in the Regulations as “*generally involving biological treatment with secondary settlement or other process*” in which the requirements listed in Figure 2-1 above are satisfied. Biological processes include conventional aeration, extended aeration, biological filtration, rotating biological contactors and comparable systems.

Appropriate treatment is required by the end of 2005 for discharges of population equivalents less than 2,000 discharging to freshwaters and estuaries and less than 10,000 discharging to coastal waters. Such treatment is defined in the Regulations as “*treatment of urban waste water by any process and/or disposal system which after discharge allows the receiving waters to meet the relevant quality objectives and the relevant provisions of the Directive and of other Community Directives*”. This will depend on local circumstances and will vary from simple physical processes to physical/biological or physical/chemical processes with varying performance standards depending on the quality objectives of the receiving waters. More stringent treatment is required for agglomerations discharging to sensitive waters.

By December 2003, the latest date covered by this report, specified treatment was required for the following:

- discharges to freshwaters and estuaries (non-sensitive) for population equivalents greater than 15,000 p.e.,

- discharges to coastal waters for population equivalents greater than 15,000 p.e., and
- discharges to sensitive areas for population equivalents greater than 10,000 p.e. as defined in Part 1 of the Third Schedule (Urban Waste Water Treatment Regulation 2001).

2.1.2. Sensitive Water Bodies

The designation of “sensitive areas” is a requirement of Article 5 of the Directive by reference to the identification criteria given in Annex II of the Directive. These criteria refer to three groups of sensitive areas:

- freshwater bodies, estuaries and coastal waters which are eutrophic or which may become eutrophic if protective action is not taken;
- surface waters intended for the abstraction of drinking water which contain more than 50 mg/l of nitrates; and
- areas where further treatment is required, to comply with other Council Directives

Member states are required by the Directive to ensure that the identification of sensitive areas is reviewed at intervals of not more than four years.

The ten water bodies which were originally designated as ‘sensitive’ by the Minister for the Environment and Local Government are listed in Part 1 of the Third Schedule of the Regulations and a further 30 were designated in the 2001 Regulations and they are set out in Part 2 of the Third Schedule the Regulations. On 15th of July 2004, Part 2 of the Third Schedule of the Regulations was amended to include two additional areas namely the Lee Estuary/Lough Mahon and Blackwater Estuary Lower. The extent of these areas is set out in Appendix A. Maps identifying these areas and the relevant catchment area are set out in Figure 2-2 to Figure 2-8 below.

Nutrient reduction in respect of all discharges from agglomerations with a population equivalent of more than 10,000 was required on commencement of the 2001 Regulations (S.I. 254 of 2001) in the case of sensitive areas specified in Part 1 of the Third Schedule and by 31 May 2008 for those areas specified in Part 2. Where discharges to sensitive water bodies occur, the Regulations specify emission limit values for total phosphorus and/or total nitrogen in addition to values for BOD, COD and TSS, which apply to discharges generally. The 2004 Urban Waste Water (Amendment) Regulations also includes a technical clarification on the reporting of phosphorous as mg/l P.

Figure 2-2. Nutrient Sensitive Waters – Eastern RBD

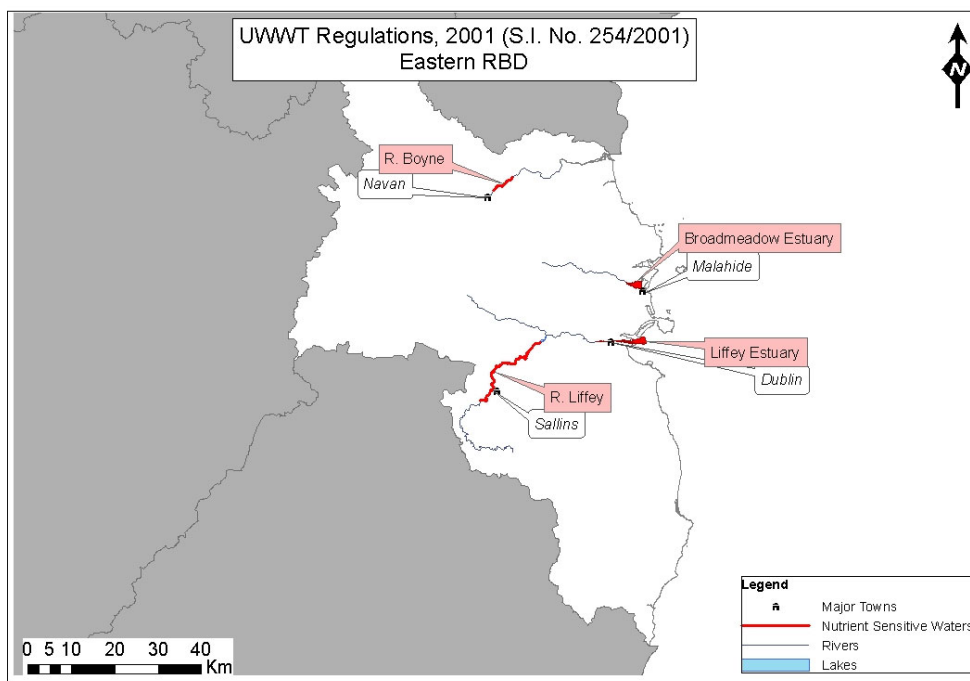


Figure 2-3. Nutrient Sensitive Waters – South Eastern RBD

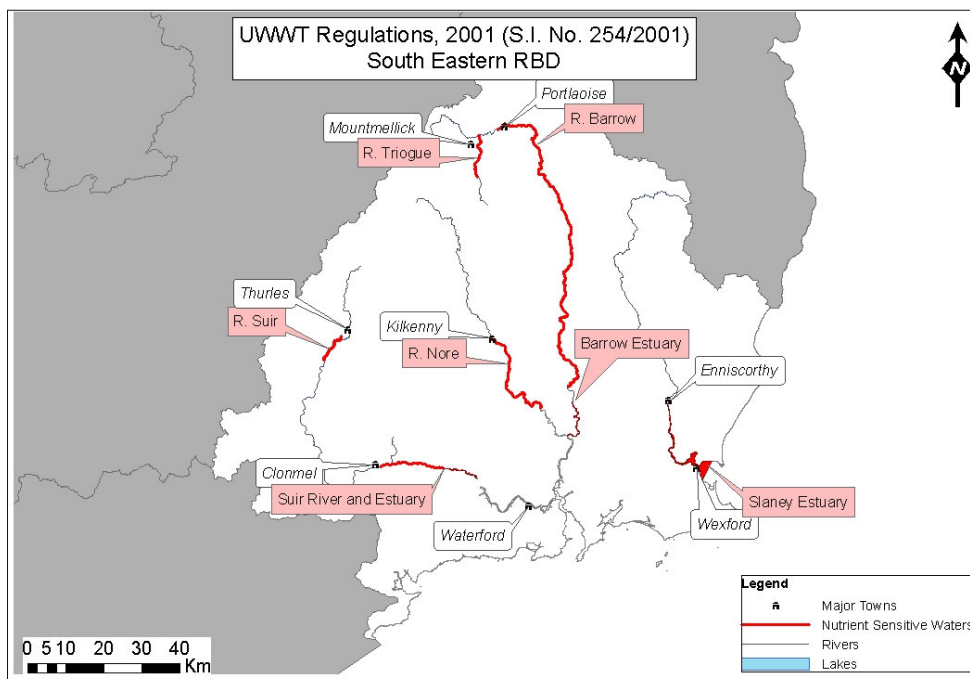


Figure 2-4. Nutrient Sensitive Waters – Southwestern RBD

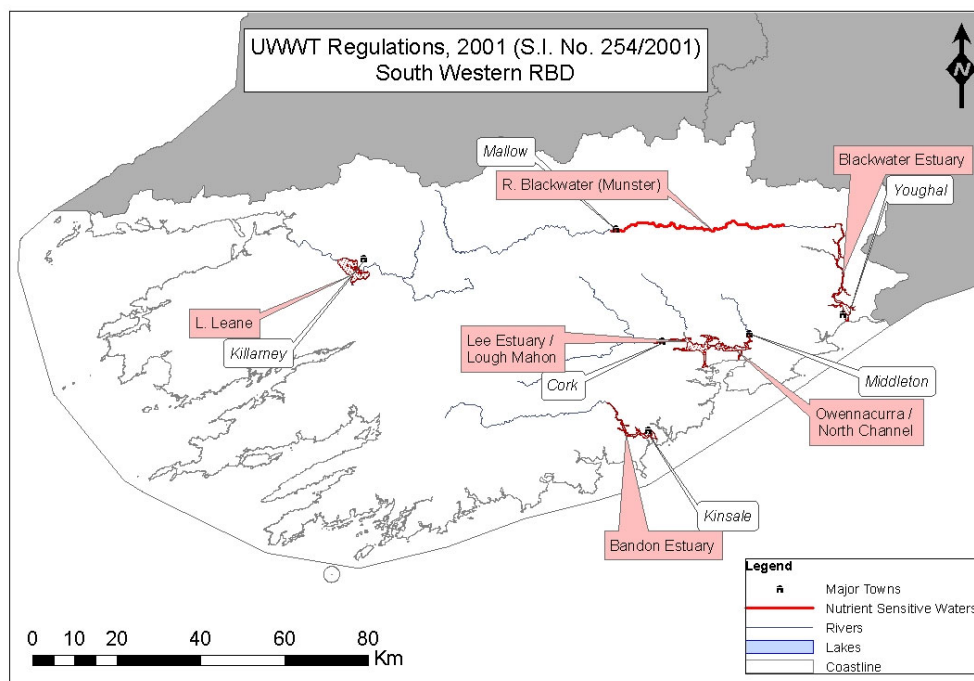


Figure 2-5. Nutrient Sensitive Waters – Western RBD

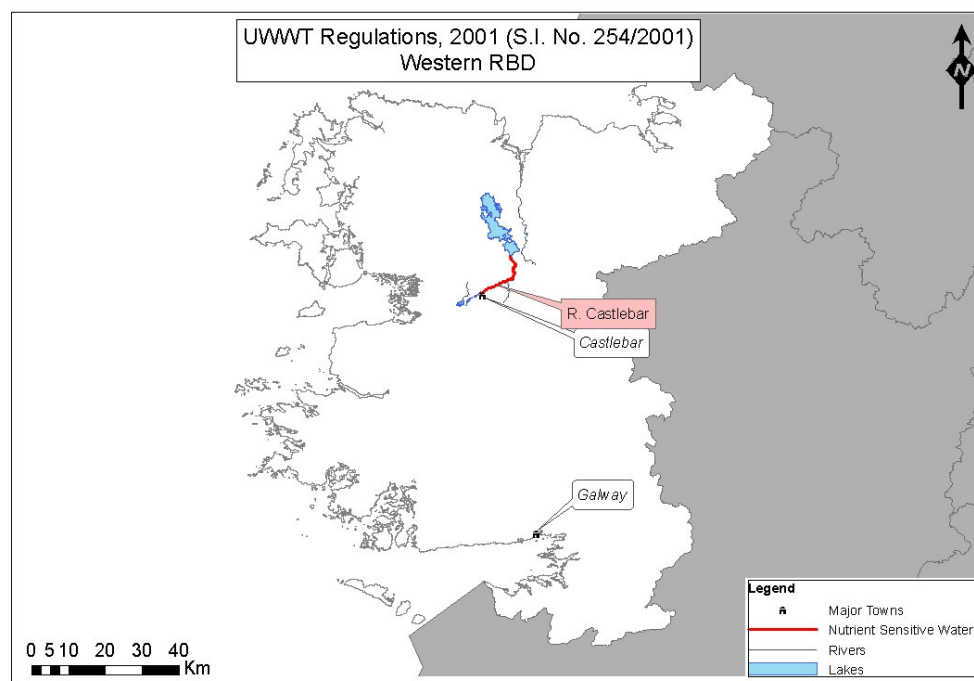


Figure 2-6. Nutrient Sensitive Waters – Nenagh Bann IRBD

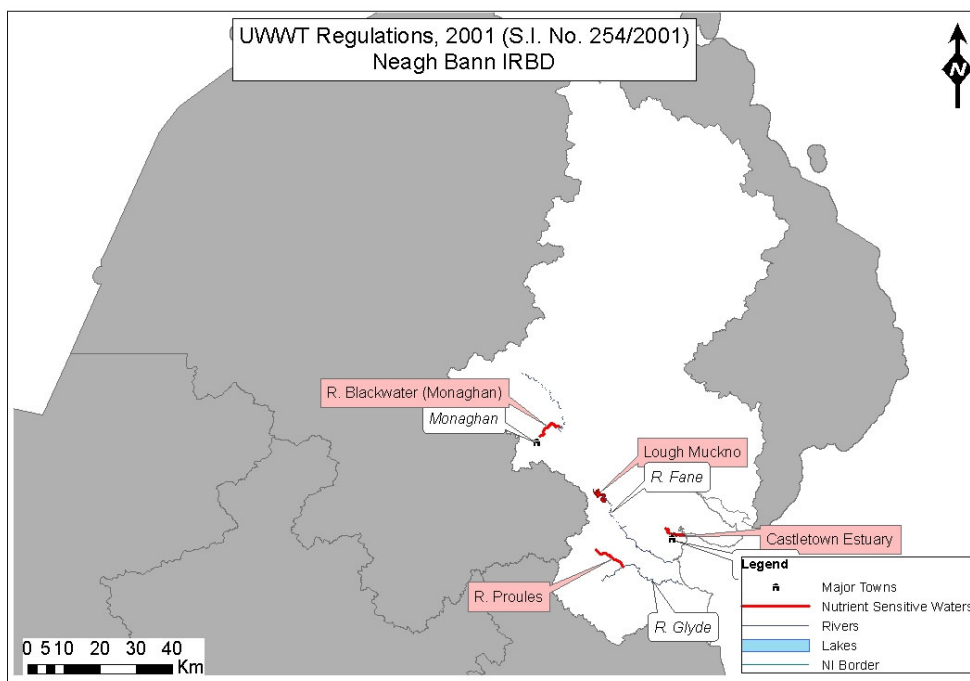


Figure 2-7. Nutrient Sensitive Waters – Northwest IRBD

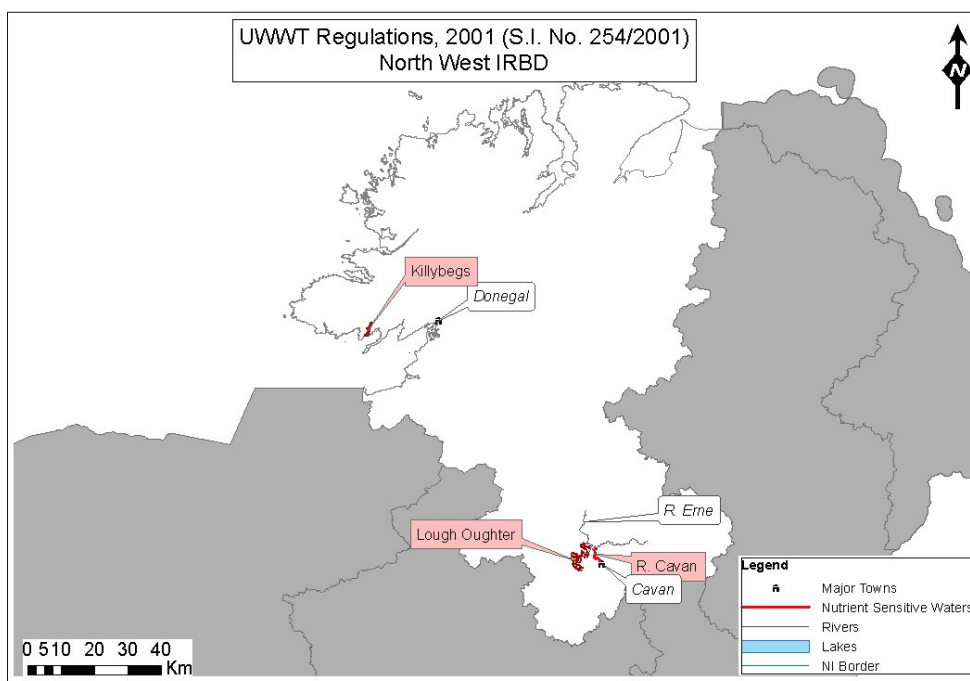
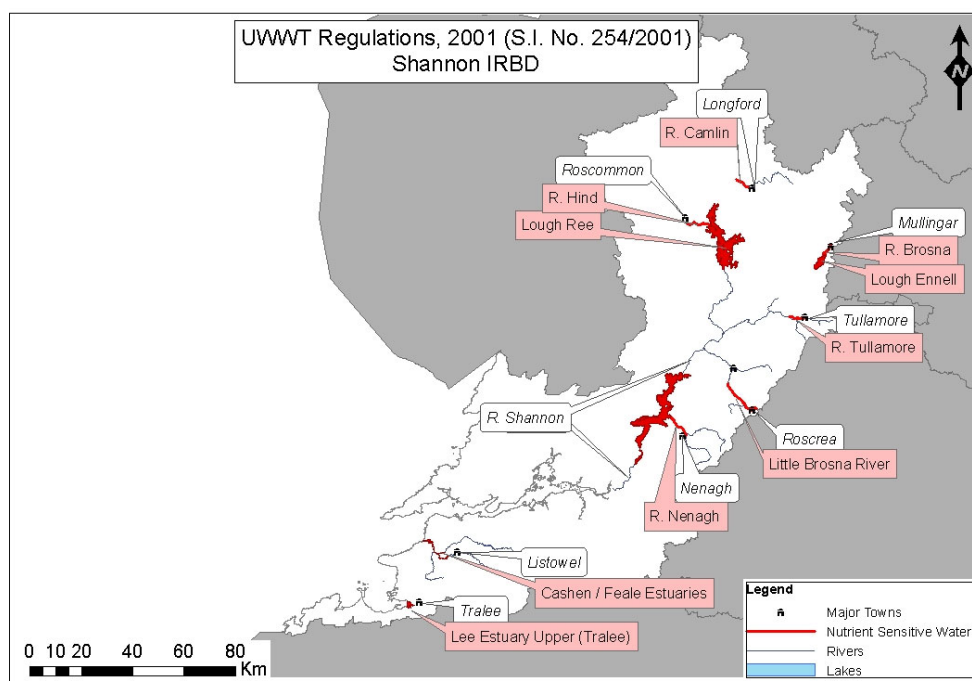


Figure 2-8. Nutrient Sensitive Waters – Shannon IRBD



2.1.3. Monitoring of Discharges

One of the principal requirements of the 2001 Urban Waste Water Regulations is to monitor the outflow from treatment plants. For most treatment plants, BOD₅, COD and TSS require monitoring. In addition, where the discharge occurs to sensitive waters (which are specified in the Third Schedule of the Regulations) total phosphorus and total nitrogen monitoring are also required. Table 2-1 lists the parameters and concentration limits with which waste water treatment plant discharges are required to comply. Although concentration limits are the recommended method to be used for calculating compliance, minimum percentage reductions in parametric values are also permitted as an alternative. The approach adopted in Ireland has been based on the use of the concentration limits for determination of compliance.

Table 2-1. Emission Limit Values for Discharges to Non-Sensitive Waters.

<i>Parameter</i>	<i>Concentration limit</i>	<i>Minimum percentage reduction</i>
<i>BOD₅</i>	25 mg/l O ₂	70-90%
<i>COD</i>	125 mg/l O ₂	75%
<i>Total suspended solids</i>	35 mg/l	90%

For discharges to sensitive waters a further two parameters are introduced, one or both of which may apply depending on conditions locally. These are outlined in Table 2-2, giving a value for concentration or for the percentage of reduction which applies.

Table 2-2. Emission Limit Values for Discharges to Sensitive Waters.

<i>Parameter</i>	<i>Concentration limit (annual mean)</i>	<i>Minimum percentage reduction</i>
Total phosphorus	2 mg/l P (10,000 - 100,000 p.e.)	80%
	1 mg/l P (more than 100,000 p.e.)	
Total nitrogen	15 mg/l N (10,000 - 100,000 p.e.)	70-80%
	10 mg/l N (more than 100,000 p.e.)	

The annual sampling frequency specified in the Regulations is set out in Figure 2-9. In summary, the frequency is dependent on the size of the agglomeration and the historical compliance record of the treatment plant (for agglomerations between 2,000 and 9,999 p.e.). In the 2000/01 report the Agency recommended that a minimum of 6 samples per year should be taken at all treatment plants whose population equivalent exceeded 500. In addition all treatment plants which serve smaller communities under the responsibility of the local authority either directly or under licence should be included in the annual sampling schedule. The sampling schedule should be designed to monitor the performance of the treatment plant and where necessary, appropriate action should be taken where poor effluent quality is produced, particularly if it affects the quality of the receiving waters.

The Regulations are specific about the type of sampling and analytical technique required to establish compliance for secondary treatment plants and those agglomerations which require nutrient reduction in addition to secondary treatment. Flow proportional or time-based 24-hour samples are required; grab samples are **not** sufficient to establish compliance.

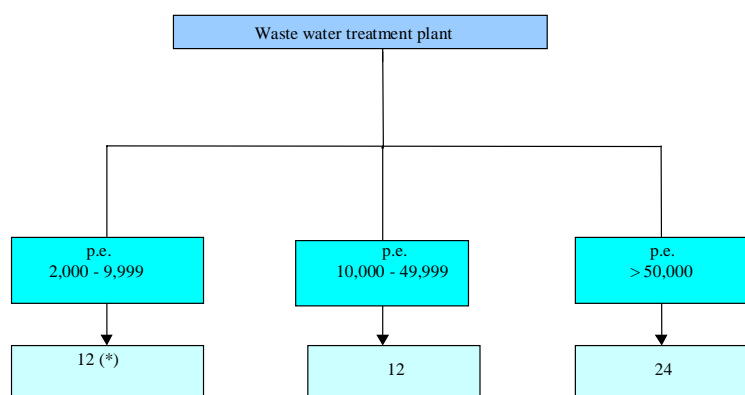


Figure 2-9. Mandatory Sampling Frequencies

* 4 samples in subsequent years (EPA recommends 6 samples), if it can be shown that the waste water discharged during the first year complies with the provisions of the Regulations; if one of the four fails, 12 samples must be taken in the year that follows.

It is important when reading this report to note that waste water discharges from the majority of agglomerations (i.e. population equivalents between 2,000 and 15,000 p.e.) are required to have secondary treatment under the UWWT Regulations by 31 December, 2005. For agglomerations less than 2,000 p.e. discharging to freshwater or estuaries 'appropriate treatment' is required by 31 December 2005. However, the Regulations apply to any **existing** secondary treatment plants that fall within the scope of the Regulations (i.e. discharges to freshwaters and estuaries from

agglomerations greater than 2,000 p.e. and discharges to coastal waters from agglomerations greater than 10,000 p.e.)¹.

Article 5 of The Regulations also require local authorities to monitor surface waters which receive discharges from urban waste water treatment plants where it is anticipated that the receiving waters will be significantly affected, with implications for compliance with other Directives. Relevant Directives and National Regulations, which should be consulted to assess the impact of a discharge on the receiving water, are summarised in Table 2-3.

The Environmental Protection Agency Act, 1992, (Urban Waste Water Treatment) Regulations, 1994: A Handbook on Implementation for Sanitary Authorities provides advice on the monitoring requirements of the 1994 Regulations and can be adopted for use with the 2001 Regulations. This handbook includes analytical recommendations in respect of discharges to both sensitive and non-sensitive areas, the latter being sub-divided into riverine and lake discharges. Appendix B of this report reproduces the recommended analyses.

Table 2-3. Relevant Directives

<i>Directive</i>	<i>Statutory Instrument</i>
<i>Freshwater Fish Directive (78/659/EEC)</i>	S.I. 293 of 1988
<i>Shellfish Directive (79/923/EEC)</i>	S.I. 200 of 1994
	and
	S.I. 459 of 2001
<i>Bathing Water Directive (76/160/EEC)</i>	S.I. 155 of 1992
	and
	S.I. 230 of 1996
<i>Surface Water Directive (75/440/EEC)</i>	S.I. 294 of 1989
<i>Dangerous Substances Directive (76/464/EEC)</i>	S.I. 258 of 1998
	and
	S.I. 12 of 2001
<i>Nitrates Directive (91/676/EEC)</i>	n/a
<i>*Water Framework Directive (2000/60/EC)</i>	S.I. 722 of 2003
<i>Groundwaters Directive (80/68/EEC)</i>	S.I. 42 of 1999

** The Water Framework Directive represents a major revision of EU water policy and establishes a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater. One of the main requirements of the Water Framework Directive is the development of "River Basin Management Plans" and the designation of a competent authority for each river basin district (RBD).*

In addition to the standards prescribed in the above Regulations, sanitary authorities must also have regard to the standards (objectives) outlined in:

- Any relevant Water Quality Management plan;

¹ Department of the Environment Circular WP 3/95

- Managing Ireland's Rivers and Lakes - A Catchment Based Strategy Against Eutrophication;
- Measures Reports for Phosphorus Regulations, 1998 (S.I. No. 258 of 1998); and
- Memorandum No.1: Technical Committee on Effluent and Water Quality Standards.

2.2. WATER QUALITY REPORT

Article 5 of the Regulations requires that more stringent requirements than those specified in Part 1 and Part 2 shall apply where the receiving waters do not satisfy other relevant community directives. The EPA Water Quality Interim Reports 2001-2003 listed nineteen locations as seriously polluted, with sewage discharges as the suspected source category identified (Table 2-4).

The relevant local authorities should further investigate the causes of pollution in these stretches of river and, should urban waste water discharges be a contributing factor, take the necessary corrective action in relation to the discharge. Corrective actions which should immediately be initiated must include a review of the plant operation and performance. Where necessary funding should be made available for modification or upgrade works to bring the particular plant into compliance with a view to improving the receiving water quality. In addition, all other identifiable sources of pollution contributing to the poor quality status of the water body should be dealt with.

The provision of nutrient reduction facilities at secondary waste water treatment plants which are below the Regulation threshold is to be welcomed considering the extent of eutrophic conditions now prevalent in Irish freshwaters.

Table 2-4. Seriously Polluted Streams and Rivers for the Period 2001-2003

<i>River Name</i>	<i>Location</i>	<i>County</i>	<i>Year*</i>
Erne	Kilconny Belturbet (LHS)	Cavan	2001
Graney (Shannon)	400 m d/s Scarriff Br.	Clare	2003
Blackwater (Munster)	Fermoy Br (LHS)	Cork	2003
Bride (Lee)	Br at Crookstown RHS	Cork	2003
St Johnston	Second Br u/s Foyle River	Donegal	2002
Maggy's Burn	Just u/s Lough Fern	Donegal	2001
Bredagh	Moville Bridge	Donegal	2001
Figile	Br S of Ticknevin Br.	Kildare	2003
Slate	Quigley's Br.	Kildare	2003
Tully St	Kilberrin Br.	Kildare	2003
Tully St	Soomeragh Br.	Kildare	2003
Glory	0.1 km d/s Br N of Kilmaganny	Kilkenny	2001
Nore	Thomastown Br (LHS)	Kilkenny	2001
Ahavarraga St	Br 0.5 km d/s Priests Br.	Limerick	2002
Loobagh	North Br, d/s Kilmallock	Limerick	2002
Rhine	Br N of Cartron	Longford	2002
Loughnamino St	Br 600 m d/s Samp Stat 0100	Mayo	2001
Tullamore	Br SW of Ballycowan Br.	Offaly	2002
Aughboy (WX)	Br NE of Middletown	Wexford	2001

*2001 EPA Interim report on the Biological Survey of River Quality - Results of the 2001 investigations,

*2002 EPA Interim report on the Biological Survey of River Quality - Results of the 2002 investigations.

*2003 Results of the 2003 investigations which have yet to be published

2.3. NATIONAL DEVELOPMENT PLAN AND WATER SERVICES PLAN

The National Development Plan (NDP) 2000 – 2006 involves an unprecedented investment in urban waste water infrastructure and water services. In August 2003 Mr. Martin Cullen, T.D., Minister for the Environment, Heritage and Local Government outlined a €5.4bn water and sewerage investment programme as part of the National Development Plan. The “Water Services Investment Programme 2003 – 2005” provides for 735 water and sewerage schemes up to the end of 2005. It is planned that each agglomeration greater than 1,000 population equivalent will have waste water treatment facilities. The 735 individual water and sewerage schemes approved under this programme include 41 schemes at construction, 367 schemes to commence construction between 2003 – 2005, 98 schemes at planning, 231 schemes under the serviced Land and Rural Towns and Villages Initiatives and water conservation projects in each city and county.

Under the NDP major parts of the water services investment programme are carried out using the Public Private Partnership (PPP) approach. A Public Private Partnership is a partnership between the public and private sector for the purpose of delivering a project or service traditionally provided by the State or other government bodies. The key objectives of these investment plans are to secure compliance with EU and National water quality and waste water standards and the provision of a modern waste water infrastructure to support future economic and social development.

The 2001-2002 report on Urban Waste Water Discharges indicated that 29% of urban waste water arisings received secondary treatment. During the reporting period 2002 – 2003 this has increased to 67% representing a significant increase in waste waters receiving secondary treatment. This increase is due to the Ringsend Treatment Plant in Dublin coming on-line. The continued investment and commitment to higher standards of sewage treatment over the coming years should lead to a significant improvement in water quality during a period of economic and social progress.

2.4. BLUE FLAG AWARDS

The Blue Flag is a well-recognised, well respected eco-label, awarded to beaches and marinas with excellent environmental management and the system currently operates in twenty four countries. An Taisce which is a member organisation of the Foundation for Environmental Education is the responsible body in Ireland for the administration of the Blue Flag scheme.

To gain a Blue Flag, a beach has to meet 26 criteria and a marina 16 criteria covering water quality, beach/marina management, safety, services and facilities, environmental education and information. In Ireland, in 2004 the European jury awarded Blue Flags to 73 beaches (75 in 2002) and 5 marinas (4 in 2002) from a total of 88 beach and 5 marina applications. The Blue Flag for beaches is only valid during the blue flag season which coincides with the bathing season (June to August). In addition to compliance with the requirements corresponding to those of the EU Bathing Water Directive there must be compliance with the standards and requirements for sewage treatment and effluent quality such as are contained in the EU Urban Waste Water Directive. There must be no industrial or sewage related discharges affecting the beach area.

For discharges to coastal waters, the compliance date for the provision of secondary treatment for population equivalents greater than a population equivalent of 15,000 p.e. was 31 December 2000 and 31 December 2005 for agglomerations between a population equivalent of 10,000 p.e. and 15,000 p.e. For discharges to coastal waters from a population equivalent less than 10,000 p.e., appropriate treatment is required by 31 December 2005.

3. SEWAGE SLUDGE

The Waste Management (Use of Sewage Sludge in Agriculture) Regulations, S.I. No. 148 of 1998 and the Waste Management (Use of Sewage Sludge in Agriculture) (Amendment) Regulations, S.I. No. 267 of 2001 were made by the Minister of State at the Department of the Environment and Local Government, under sections 7 and 51 of the Waste Management Act, 1996 (S.I. No. 10 of 1996). The Regulations implement the requirements of Council Directive 86/278/EEC on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture.

It is imperative that sewage sludge used or supplied for use in agriculture be used in accordance with the Regulations in order to minimise the risk to human, animal or plant health. Untreated sewage sludge may contain bacteria, viruses and parasites which can be eliminated or reduced by an appropriate treatment. The spreading of sewage sludge should not take place inside the estimated zone of contribution of private or public water supplies. It also is recommended that the “Code of Good Practice for the Use of Bio-solids in Agriculture” (Guidelines for Local Authorities and Wastewater Treatment Plant Operators) published by The Department of Environment and Local Government is strictly followed to provide a safe and sustainable use for sewage sludge in agriculture.

The Schedule to the Regulations (S.I. No. 148 of 1998) sets out maximum values for concentrations of heavy metals in soil (Part I), limit values for amounts of heavy metals which may be added annually to agricultural land, based on a ten year average (Part II, as amended by S.I. 267 of 2001), conditions for soil sampling and analysis (Part III), conditions applying to sludge sampling and analysis (Part IV) and methods of analysis (Part V). These are reproduced in Appendix C.

The Waste Management (Use of Sewage Sludge in Agriculture) (Amendment) Regulations, 2001 were made in June 2001 and amend the Waste Management (Use of Sewage Sludge in Agriculture) Regulations, 1998 (S.I. No. 148 of 1998). The amendments include the replacement of the two tonne per hectare per year limit on the amount of dry matter to be added to the soil, with limits based on absolute quantities of specified heavy metals which may be applied annually based on a ten year average. A welcome amendment is the addition to Article 4 of the Regulations which states that “*A person shall, in using sewage sludge in agriculture; ensure that sludge is not used except in accordance with a nutrient management plan*”. Where sludge is applied to land in excess of the nutrient requirement it is considered disposal and not reuse or recycling. The Regulations also require additional analytical data to be included in the local authorities sludge register such as dry matter, organic matter, pH, nitrogen and phosphorous in addition to the metals specified in Part II of the Schedule. The EPA recommends that local authorities update the sludge register and maintain it according to Article 8 of the Regulations.

Any person using sludge in agriculture is required (under Article 4, The Waste Management (Use of Sewage Sludge in Agriculture) Regulations, S.I. No. 148 of 1998) to ensure that the quality of the soil, surface water and ground water is not impaired and ensure that sludge is not used except in accordance with a nutrient management plan.

The Waste Management Act, 1996 introduced radical changes in waste management planning in this country. Local authorities are responsible for the preparation of waste management plans for all non hazardous wastes produced within their functional area. The Waste Management (Planning) Regulations, 1997, S.I. 137 of 1997 set out the waste arisings which a plan must include (Article 2.1(a)). Sludge arisings from urban waste water treatment plants in the local authority area must be quantified and included in the plans.

Section 39 of the Waste Management Act, 1996 states that a person “shall not dispose of or undertake the recovery of waste at a facility unless the person has obtained a waste licence”. The treatment of sewage sludge (e.g. thermal treatment/anaerobic digestion/aerobic digestion/lime stabilisation) is exempted under the Act provided that the treated sludge is recovered. The EPA considers that disposal of treated sludge to landfill or application of sludge to lands, which exceed the crop requirements, cannot be considered as recovery. Hence, the exemption provided for in the Act does not apply in these cases. Local authorities are thus required to obtain the appropriate authorisation under the Waste Management Act, where sludge is treated and the resultant sludge is not sent for recovery. Where a design, build and operate model is planned in such circumstances, the local authority is advised to make provision in any contract documents to obtain a waste licence for such an activity.

4. IMPLEMENTATION OF THE REGULATIONS BY THE EPA

As mentioned earlier, the first milestone specified in the 2001 Urban Waste Water Regulations passed on the 31 December 1998. After this date, agglomerations with a population equivalent greater than 10,000 discharging into sensitive waters or the catchment of sensitive waters require nutrient reduction facilities. The next deadline in the Regulations was the 31 December 2000. After this date, agglomerations with a population equivalent greater than 15,000 persons were required to treat waste water arisings to secondary treatment standards and comply with the other requirements of the Regulations. The next most important milestone in the provision of treatment infrastructure is the 31 December 2005, when agglomerations with a population equivalent between 2,000 and 15,000 p.e. discharging to non-sensitive areas, agglomerations between 10,000 and 15,000 p.e. discharging to coastal waters and agglomerations between 2,000 and 10,000 p.e. discharging to sensitive areas require secondary treatment. By comparing Figure 2-1(Treatment Plant Requirements) and Table 5-3 it can be demonstrated that this very significant deadline has implications for almost 90% of the agglomerations in the country. In addition to those plants above 500 p.e. reported to the EPA for the purposes of this report, agglomerations below 500 p.e. also require appropriate treatment and as such it is recommended that each local authority review the quality of receiving water and that appropriate treatment is provided to ensure compliance with other Community Directives.

Section 59 of the EPA Act, 1992 states that:

“Where a standard or other requirement is prescribed under subsection (2), the sanitary authority shall, where necessary, take steps as soon as is practicable, or within such period as may be prescribed for compliance with such standard or other requirement, to ensure that the said effluent complies with the standard or other requirement”.

In general, the Agency has noted in previous reports on Urban Waste Water Discharges in Ireland that local authorities are aware of the necessary infrastructure and deadlines required by the Regulations. However, delays in the planning process and/or construction commencement may delay the provision of the requisite treatment systems. The Agency will take this into account during the enforcement of the Regulations where such delays are outside the control of the local authority. However, where adequate monitoring of population trends and development is not undertaken which results in non-compliance with section 59 of the EPA Act, 1992; enforcement action will be considered against the local authority. This enforcement action will be proportionate to the non-compliance detected.

The Agency has noted in previous reports that for the most part, a monitoring programme exists for urban wastewater discharges. Particular attention however, is drawn to the requirements of the minimum frequency of analyses, the analyses of obligatory parameters and for 24-hour flow proportionate sampling, to establish compliance with the Regulations. Where a non-compliance with these requirements is recorded, the authority will be liable to enforcement action, which again will be proportionate to the non-compliance.

In 2003 The Office of Environmental Enforcement was established, which is a new Office within the EPA, dedicated to the implementation and enforcement of environmental legislation in Ireland. The Office of Environmental Enforcement delivers enhanced enforcement in two ways. It is directly responsible for enforcing EPA licences issued to waste, industrial and other activities. It also supervises the environmental protection activities of local authorities, through auditing their performance, providing advice and guidance, and in appropriate cases, giving binding directions. The Protection of Environment Act, 2003 confers new powers on the Environmental Protection Agency regarding the monitoring of the performance of statutory functions of local authorities. It is anticipated that these powers will be used, where the EPA considers that a local authority is failing to carry out statutory environmental functions in relation to the management of urban waste water and sewage sludge.

During 2003 and 2004 the Agency carried out a number of audits and recommended that some local authorities review their monitoring schedules for both the influent and effluent to ensure that the mandatory level of monitoring is carried out at all plants. The monitoring results and recommendations are presented in the following chapter.

5. FINDINGS OF THE 2002/2003 MONITORING

This section of the report provides an overview of the level of treatment afforded to urban waste water during the review period (2002 & 2003). A series of tables sets out details on the numbers and relative sizes of agglomerations throughout the country, the receiving waters to which waste water from these agglomerations discharge and an analysis of the level of treatment provided. Details about individual agglomerations and level of treatment provided are presented in Appendix D, grouped by local authority, so that the reader can easily review the information for a particular local authority.

The overall performance of secondary waste water treatment plants throughout the country during the review period is also evaluated. A complete listing of the number of samples taken and analysed for BOD, TSS and COD for secondary waste water treatment discharges during the review period is reported in Appendix E, together with an analysis of exceedances, which are highlighted. As with Appendix D, this information is grouped by local authority and provided for each secondary waste water treatment plant in the country. A colour code (green) is used to show whether or not an individual plant is failing to meet the effluent quality standards set by the Regulations. The blue code indicates that an insufficient number of samples were taken. The overall performance of plants that should be in compliance with the Regulations is therefore evaluated along with a general evaluation of all secondary treatment plants for which data was reported. Details are also provided about the performance of those plants discharging to sensitive waters and estuaries, described in Part 1 of the Third Schedule of the 2001 Regulations, which are by now required to have nutrient removal in addition to secondary treatment.

By the end of the review period, all agglomerations with a population equivalent greater than 15,000 were required to have secondary treatment and be in full compliance with the quality standards set out in the Regulations. Furthermore, agglomerations discharging to sensitive waters and estuaries specified in Part 1 of the Third Schedule to the 2001 Regulations were required to have nutrient removal in addition to secondary treatment. Existing secondary treatment plants that fall within the scope of the Regulations (i.e. plants discharging to freshwaters and estuaries serving agglomerations greater than 2,000 p.e. and plants discharging to coastal waters serving agglomerations greater than 10,000 p.e.) are also to be in full compliance with the quality standards set out in the Regulations.

As stated earlier, the Regulations are specific about the type of sampling that is to be conducted in order to demonstrate compliance with the quality standards set by the Regulations. Sampling procedures used by local authorities have therefore been reviewed and compared with the requirements of the Regulations.

Finally, the quantities of sewage sludge generated by primary and secondary treatment plants in each local authority area during the reporting period is reported (Appendix F) and commentary provided on the management practices employed.

5.1. WASTE WATER TREATMENT

Data on 443 agglomerations with a population equivalent greater than 500 persons were reported to the Agency for the 2002/2003 period. Of the 443 agglomerations, 295 receive secondary treatment (38 of which also receive nutrient reduction), 94 receive primary treatment and 54 either receive preliminary treatment or no treatment (see Table 5-1). Comparative figures for 2000/2001 are also provided in parenthesis.

Table 5-1. Waste Water Treatment Facilities for Agglomerations Greater Than or Equal to 500 Population Equivalent for the Year 2002/2003 (years 2000/01 in brackets)

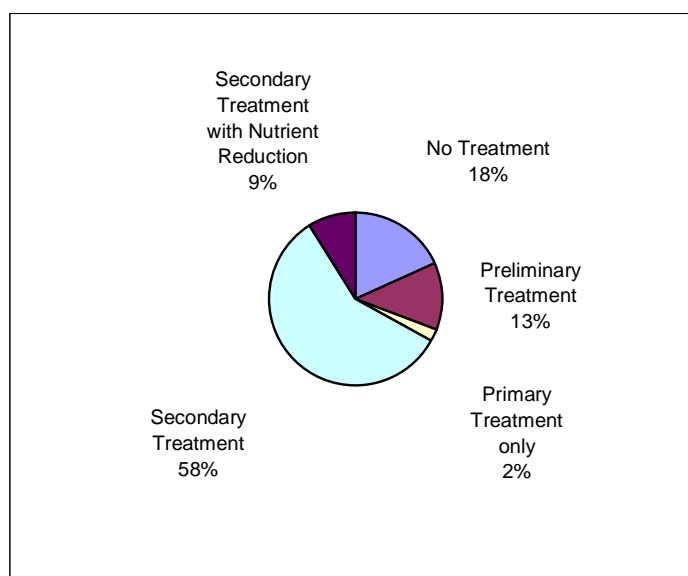
	<i>No treatment</i>	<i>Preliminary treatment only</i>	<i>Primary treatment only</i>	<i>Secondary treatment only</i>	<i>Secondary treatment with nutrient reduction</i>	<i>Total</i>
<i>Number of agglomerations</i>	31 (32)	23 (22)	94 (98)	257 (226)	38 (34)	443 (412)
<i>Total population equivalent (p.e.)</i>	1,060,887 (1,271,369)	727,280 (372,472)	136,858 (2,268,113)	3,366,895 (1,131,713)	510,504 (449,671)	5,802,424 (5,493,338)

Table 5-1 indicates that in the reporting period 2002 and 2003:

- 18% of waste water arisings did not receive any form of treatment (23% in 2000/2001);
- 13% of waste water arisings received preliminary treatment only (7% in 2000/2001);
- 2% of waste water arisings received primary treatment only (41% in 2000/2001);
- 58% of waste water arisings received secondary treatment only (21% in 2000/2001);
- 9% of waste water arisings received nutrient reduction in addition to secondary treatment (8% in 2000/2001).

These statistics are illustrated in Figure 5-1 below.

Figure 5-1. Waste Water Facilities for Agglomerations with a Population Equivalent Greater than 500



The national population equivalent figure has increased from 5,493,338 for 2000/2001 to 5,802,424 for 2002/2003, which is an increase of 5.6%. The main reason for the increase can be attributed to the revised population equivalent used for Killybegs. The revised population equivalent for Killybegs is now 400,000 p.e. which takes into account the unusually high industrial load from the fish processing industry. The figure of 4,000 p.e. used in the previous report only related to the actual population and associated commercial activities in the town.

The number and size of agglomerations is given in Table 5-2. Five agglomerations (Dublin City (Ringsend Treatment Plant), North Dublin, Cork, Dundalk and Killybegs) exceed population equivalents of 150,000 persons and collectively represent almost 60% of the waste water discharges for 2002/2003. The greatest number of agglomerations reported in 2000/2001 related to the class 2,000 to 10,000 persons equivalent; however, data returned for the year 2002/2003 shows that agglomerations in the class 500 to 1,000 p.e. are now most common, with 141 out of a total of 443, representing 1.4% of total population equivalent.

Table 5-2. Number of Agglomerations and Population Equivalents (2003)

<i>Normal and Sensitive Areas</i>			
<i>Class of Agglomeration</i>	Number	Total population equivalent (p.e)	% of Total population equivalent (p.e)
<i>500 to 1,000 p.e.</i>	141	92,315	1.6
<i>From 1,001 to 2,000 p.e.</i>	115	155,053	2.7
<i>From 2,001 to 10,000 p.e.</i>	130	569,983	9.8
<i>From 10,001 to 15,000 p.e.</i>	21	273,334	4.7
<i>From 15,001 to 50,000 p.e.</i>	23	590,244	10.2
<i>From 50,001 to 150,000 p.e.</i>	8	626,339	10.8
<i>150,001 p.e. and above.</i>	5	3,495,156	60.2
Total	443	5,802,424	100

Table 5-3 presents an overview of the types of receiving water to which agglomerations discharge their waste water. Almost 87% of waste water arisings discharge into either freshwaters or estuaries and 13% to coastal waters. The increase in percent discharge to freshwaters and estuaries is due mainly to the increased population equivalent reported for Killybegs and the diversion of waste water to the Ringsend plant which previously discharged to coastal waters. During the reporting period there were 40 water bodies designated as sensitive areas which receive waste water from 163 agglomerations (≥ 500 p.e.). Discharges to sensitive areas or the catchment of sensitive areas now account for almost 62% of total discharges. However, it should be noted that the discharge from the new Ringsend Treatment Plant to the Liffey Estuary accounts for 61% of the total discharge to sensitive areas. The next largest discharge to a sensitive area is from Killybegs (Co. Donegal) with a population equivalent of 400,000 p.e.

Table 5-3. Agglomerations and Population Equivalents Categorised by Receiving Waters (2003)

<i>Class of agglomeration</i>	<i>Normal Areas</i>				<i>Sensitive Areas</i>	
	Freshwaters and Estuaries		Coastal Waters		Freshwaters and Estuaries	
	No.	P.E	No.	P.E	No.	P.E
<i>From 500 to 1,000 p.e.</i>	79	50,128	5	3,330	57	38,857
<i>From 1,001 to 2,000 p.e.</i>	66	90,143	12	13,778	37	51,132
<i>From 2001 to 10,000 p.e.</i>	67	293,281	21	96,869	42	179,833
<i>From 10,001 to 15,000 p.e.</i>	8	108,750	2	25,500	11	139,084
<i>From 15,001 to 50,000 p.e.</i>	8	170,300	3	84,633	12	335,311
<i>From 50,001 to 150,000 p.e.</i>	3	247,000	2	138,700	3	240,639
<i>Greater than 150,001 p.e.</i>	2	507,535	1	400,813	2	2,586,808
<i>Totals</i>	233	1,467,137	46	763,623	164	3,571,664

During the review period 2002-2003 a number of agglomerations have had their treatment facilities upgraded. These include, Killeagh (Co. Cork), Carndonagh (Co. Donegal), Ringsend (Dublin City), Blanchardstown, Swords, (Fingal) Stradbally (Co. Laois), Adare, Askeaton, Rathkeale, Abbeyfeale, Ballymahon (Co. Limerick), Drogheda, Dundalk (Co. Louth), Ballyhaunis, Cong, Westport (Co. Mayo), Ballisadare (Co. Sligo), Clonroche, Courtown, Riverchapel, Rosslare Strand, and Wexford Town (Co. Wexford). Agglomerations which are now connected to the Ringsend plant in Dublin City are Ashbourne, Dunboyne, Rathoath, Blanchardstown, Newcastle, Saggart and a portion of what is known as the North Dublin Drainage.

The number of secondary treatment plants in operation during 2002 and 2003 is presented in Table 5-4 as a function of the receiving water to which they discharge. Two hundred and eighty one secondary treatment plants were in operation during the reporting period, of which one hundred and twenty seven discharge to sensitive areas or to the catchment of sensitive areas as specified in the 2001 Urban Waste Water Regulations.

All agglomerations with population equivalents greater than 15,000 p.e. were required to have secondary treatment by 31 December 2000. Of the forty agglomerations of 15,000 p.e. or greater only twenty seven of these had secondary treatment installed and operational by the end of the reporting period. Agglomerations that did not have the necessary level of treatment installed and operational by the end of 2003 were Arklow, Ballykeeffe, Bray, Cork City, Galway City, Howth, Killybegs, Limerick, Shangannagh, Sligo, Tramore, Tramore River Valley (Cork) and Waterford City. Many of the above agglomerations however have treatment plants at various stages of planning/construction with some due to complete commissioning phases during 2004, namely Cork City (including Tramore River Valley), Limerick City (to include Ballykeeffe) and Galway City. Waste water treatment plants due to commence construction in 2005 are Arklow, Killybegs (part of the Donegal Bay Project), Shangannagh (including Bray), Sligo, Tramore, and Waterford City. Howth (including Baldoyle, Sutton and Portmarnock) is due for connection to the Ringsend plant via the Sutton pumping station in 2005.

Details of the current status of drainage schemes and treatment plants can be found at the Private Public Partnership website at http://www.ppp.gov.ie/sectors/water_and_waste_water.

Table 5-4. Secondary Waste Water Treatment Plants (2003)

<i>Class of Agglomeration</i>	<i>Normal Areas</i>		<i>Sensitive Areas</i>	<i>Total No. of Secondary treatment plants</i>
	Freshwaters and estuaries	Coastal Waters	Freshwaters and estuaries	
<i>From 500 to 1000 p.e</i>	64	2	45	111
<i>From 1,001 to 2,000 p.e</i>	29	2	21	52
<i>From 2,001 to 10,000 p.e</i>	38	5	33	76
<i>From 10,001 to 15,000 p.e</i>	4	2	11	17
<i>From 15,001 to 50,000 p.e</i>	4	2	13	19
<i>From 50,001 to 150,000 p.e</i>	1	0	3	4
<i>p.e 150,001 and above</i>	1	0	1	2
<i>Total</i>	141	13	127	281

Table 5-5 details the discharges to sensitive areas or the catchment of a sensitive area and the extent to which nutrient reduction facilities have been provided. It should, however, be noted that Article 4 of the 2001 Regulations requires the application of more stringent effluent quality standards than those specified in the Regulations where this is required to ensure that the receiving waters satisfy any other relevant Community Directives. This may mean that many of those agglomerations discharging to sensitive areas with population equivalents of less than 10,000 p.e. could also require nutrient reduction. A more detailed assessment of these agglomerations and receiving waters is therefore required in order to assess future needs to secure compliance by the appropriate dates.

Table 5-5. Discharges to Sensitive Areas (2003)

<i>Class of Agglomeration</i>	<i>Number of Primary Treatment Plants discharging to sensitive areas</i>	<i>Number of secondary treatment plants discharging to sensitive areas</i>		<i>Total number of discharges to sensitive areas</i>
		<i>...without nutrient reduction</i>	<i>...with nutrient reduction</i>	
<i>From 500 to 1000 p.e</i>	16	41	4	61
<i>From 1,001 to 2,000 p.e</i>	7	18	3	28
<i>From 2,001 to 10,000 p.e</i>	5	28	5	38
<i>From 10,001 to 15,000 p.e</i>	0	7	4	11
<i>From 15,001 to 50,000 p.e</i>	0	4	9	13
<i>From 50,001 to 150,000 p.e</i>	0	1	2	3
<i>p.e 150,001 and above</i>	0	1	0	1
<i>Total</i>	28	100	27	155

5.2. SECONDARY WASTE WATER TREATMENT PLANT PERFORMANCE

Appendix E contains details on the performance of secondary treatment plants throughout the country with respect to BOD, COD and TSS. Where breaches of effluent quality standards have occurred, these are highlighted in green. The Regulations allow a limited number of outflow samples from secondary wastewater treatment plants to fail (see appendix A) provided that in the cases of BOD₅, COD and TSS, respectively, the limits 50 mg/l O₂, 250 mg/l O₂ and 87.5 mg/l are not exceeded. This means that if a single sample exceeds these values then the required standard has not

been achieved. Hence, if column three for each parameter in Appendix E shows a value (shaded green) greater than zero, the plant has not complied with the requirements of the Regulations. In addition to the above rules of compliance, if a local authority fails to take the minimum number of samples specified in the Regulations then the treated discharge has failed to meet the requirements and as such is non-compliant.

An analysis of the 2003 data for the larger treatment plants in Ireland, i.e., treatment plants serving agglomerations of >15,000 p.e. showed that 13 out of 25 plants meet the required standards (compliance rate of 52%). Plants in this class that failed to meet the standards were,

- ❖ Mortarstown (Co. Carlow),
- ❖ Cavan Town,
- ❖ Letterkenny, (Co. Donegal),
- ❖ Malahide (Fingal County Council),
- ❖ Kilkenny City
- ❖ Portlaoise (Co. Laois)
- ❖ Longford Town
- ❖ Ballina, Castlebar and Westport (Co. Mayo),
- ❖ Monaghan Town
- ❖ Mullingar (Co. Westmeath)

More than half of the failures (9 of 12 plants) in this category (>15,000 p.e.) failed because an insufficient number of samples were taken during the year. These plants were Mortarstown (Co. Carlow), Cavan Town, Kilkenny City, Longford, Castlebar, Westport and Ballina (Co. Mayo), Monaghan Town and Mullingar Co. Westmeath. The remaining 3 plants namely Letterkenny, Malahide and Portlaoise, failed to meet the required discharge limits for either BOD, COD and TSS or all three. The Letterkenny plant continues to have consistent breaches of the limits for all three parameters. Results were not returned for the Westport plant in County Mayo so it was included in the insufficiently sampled category. In addition the sampling frequency of waste water treatment plants in Counties Mayo and Wexford during the reporting period was low and needs to be updated to ensure compliance with the Regulations.

In the category of treatment plants serving a population greater than 10,000 p.e with nutrient reduction, plant performance is unsatisfactory. Of a total of 14 plants, 6 (43%) failed to comply with the Regulations. Of the 6 plants that failed, four had an insufficient number of samples taken and 2 did not meet the required discharge limits for BOD, COD, TSS or Total P.

For secondary treatment plants serving agglomerations of between 2,000 and 15,000 p.e., only 30 out of 105 plants met the standards (compliance rate of 29%).

For secondary treatment plants serving agglomerations between 500 p.e. and 2,000 p.e. only 35 out of 160 complied with the Regulations (compliance rate of 22%). Some of this non-compliance can be attributed to insufficient/non-existent sampling.

This illustrates that there is a persistent problem with the operation, maintenance and management of smaller secondary treatment plants in Ireland. Local authorities are urged to review the operation of all urban waste water treatment plants in their functional areas and to implement corrective action programmes for those plants that are failing to meet the effluent quality standards set by the Regulations. Particular priority should be placed on correcting

plants whose discharges are causing environmental pollution in the waters to which the effluents discharge and a review of the treatment plant performance and operation should be initiated to ensure compliance.

In addition to the concentration limits set out in the Regulations (second schedule Part 1), the requirements for discharges from waste water treatment plants to sensitive areas which are subject to eutrophication, include concentration limits for total phosphorous and total nitrogen. One or both parameters may be applied depending on the local situation. Table 5-6 presents the results of phosphorous monitoring at plants greater than 10,000 p.e. which discharge to sensitive areas specified in the Third Schedule Part 1 and Part 2 of the 2001 Urban Waste Water Regulations. Plants discharging to sensitive areas set out in Part 1 of the Third Schedule, which should be in compliance since 31 December 1998 are highlighted in blue.

The annual mean Total P concentration of the discharge from the Osberstown waste water treatment plant which was highlighted as a exceedance in the previous report has substantially improved to an average of 0.7 mg/l P. The sampling frequency for total P at the Castlebar, Athy and Mortarstown waste water treatment plants was below the required level as specified in the Regulations. The EPA recommends that local authorities review their monitoring programmes and ensure that the sampling frequency for total P complies with the Regulations.

Table 5-6. Phosphorus Monitoring at plants greater than 10,000 p.e.

<i>Local Authority</i>	<i>Name of Treatment Plant*</i>	<i>No. of Samples Total P</i>	<i>Annual Mean Total P mg/l P</i>	<i>No. of Samples o-P</i>	<i>Annual Mean Ortho-p mg/l P</i>
<i>Carlow County Council</i>	Mortarstown	6	0.5	-	-
<i>Cavan County Council</i>	Cavan	10	0.6	9	0.2
<i>Dublin City Council</i>	Ringsend	283	4.3	178	2.2
<i>Fingal County Council</i>	Malahide	-	-	43	4.0
<i>Fingal County Council</i>	Swords	-	-	46	0.7
<i>Kerry County Council</i>	Killarney	50	0.3	-	-
<i>Kildare County Council</i>	Athy	2	4.4	2	4
<i>Kildare County Council</i>	Leixlip	48	1.1	-	-
<i>Kildare County Council</i>	Osberstown	290	0.7	290	0.5
<i>Kilkenny County Council</i>	Purcellsinch	-	-	2	0.6
<i>Laois County Council</i>	Portlaoise	-	-	14	0.7
<i>Longford County Council</i>	Longford	11	0.4	-	-
<i>Mayo County Council</i>	Castlebar	1	0.1	1	0.1
<i>Meath County Council</i>	Navan	12	1.5	9	1.3
<i>Offaly County Council</i>	Tullamore	12	0.5	11	0.4
<i>Tipperary N.R. Co. Co.</i>	New Nenagh	12	0.5	8	0.4
<i>Tipperary S.R. Co. Co.</i>	Clonmel	12	1.5	-	-
<i>Westmeath County Council</i>	Mullingar	11	0.3	15	0.1
<i>Westmeath County Council</i>	Athlone	16	0.9	19	0.5

Plants discharging to sensitive areas set out in the 2001 Regulations, Part 1 of the Third Schedule, are highlighted.

5.3. SAMPLING

There has been an increase in the total number of results returned to the EPA for all parameters except total P which is slightly lower than those reported in 2001/2002 (see Table 5-7). Despite the increase in the number of samples returned to the EPA many local authorities are still not carrying out the minimum sampling frequencies as set out in the Regulations. This was highlighted in the previous section on secondary treatment plant performance. Again it

must be stressed that compliance with the Regulations cannot be achieved if the sampling frequency requirements are not met.

Table 5-7. Number of Analytical Results Reported in 2002/2003

<i>Sample Type</i>	<i>Year</i>	<i>BOD₅</i>	<i>COD</i>	<i>TSS</i>	<i>Total P</i>	<i>Ortho-P</i>
<i>Inflow</i>	2002	2746	2871	2718	1231	944
	2003	3307	3720	3007	1577	1764
<i>Outflow</i>	2002	3337	3396	3553	1533	1236
	2003	3811	4285	3806	1939	2287

Monitoring of the inflow to a plant is important in order to determine the correct population equivalent for an agglomeration and also in the identification of unexpected loads which may affect the operation of the plant. Outflow monitoring is important to establish compliance with the standards specified in the Regulations. The Regulations are specific about the type of sampling and analytical technique required to establish compliance for secondary treatment plants. Flow proportional or time-based 24-hour samples are required; grab samples are not sufficient to establish compliance.

Of the 3,811 total outflow samples for BOD taken in 2003, over 54% were grab samples, which is not in compliance with the Regulations. An analysis of the plants which fall within the scope of the Regulations (i.e. discharges to freshwaters and estuaries from agglomerations greater than 2,000 p.e. and discharges to coastal waters from agglomerations greater than 10,000 p.e.) shows that nearly 50% of samples taken were grab samples.

For larger plants with population equivalents of greater than 10,000 there has been an increase in the amount of composite sampling since the previous reporting period from 67% to 69% which, although an improvement, is still not fully in compliance with Regulations. Local authorities should take the necessary steps to rectify this situation and ensure that the correct procedures are applied when sampling secondary treatment plants that fall within the scope of the Regulations. These procedures (i.e. flow proportional or time-based 24-hour sampling) should also be applied at plants serving agglomerations of less than 2,000 p.e.

The Regulations also specify the minimum number of samples to be taken each year depending on agglomeration size (see Appendix A). A county-by-county account of the number and compliance of outflow samples from secondary waste water treatment plants is given in Appendix E. Where the number of samples returned for a particular plant is less than that required, the corresponding box in the table is highlighted in blue. An examination of Appendix E indicates that for 66 plants with a population equivalent greater than 2,000, the required number of samples were not taken during 2003. This situation is totally unacceptable as compliance with the Regulations for those particular plants cannot be determined. It is therefore strongly advised that local authorities review their monitoring programmes to ensure that the requisite monitoring according to the Fifth Schedule of the 2001 Urban Waste Water Regulations is undertaken at all plants. Enforcement action may be taken against local authorities that continue to ignore this basic requirement of the 2001 Regulations.

5.4. SEWAGE SLUDGE

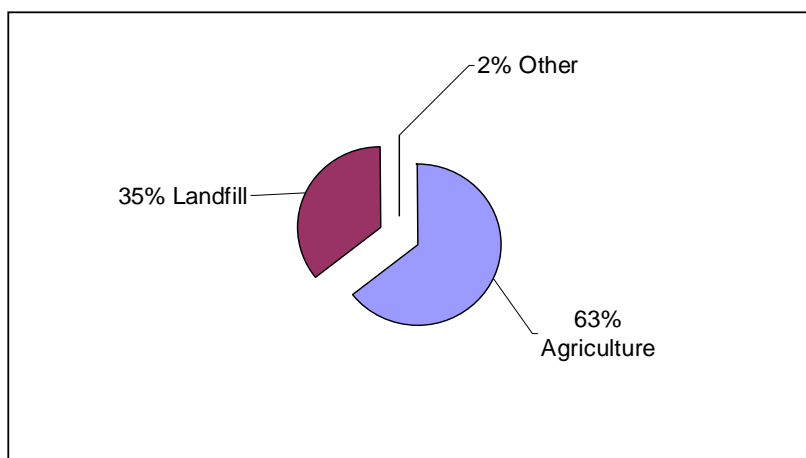
During the reporting period a total of 42,298 tonnes (2003) and 33,754 tonnes (2002) respectively of dry solids were reported to have been produced nationally by agglomerations with population equivalent greater than 500 persons.

The use of sewage sludge in agriculture has increased since the last report and now accounts for 63% of the total sludge arisings compared with 45% in 2001/2002 and only 23.2% in 1998/99. The disposal routes for sewage sludge are set out in Table 5-8 and illustrated in Figure 2-1 below.

Table 5-8. Sewage Sludge Reuse and Disposal Routes (2001 in Brackets)

	<i>Agriculture</i>	<i>Landfill</i>	<i>Sea Disposal</i>	<i>Other or Unspecified</i>	<i>Total</i>
Sludge					
Quantity	26,743	14,909	0	646	42,298
tds/yr	(15,155)	(18,052)	(0)	(352)	(33,559)
% of Total	63	35	0	2	100
	(45)	(54)	(0)	(1)	(100)

Figure 5-2. Sewage Sludge Reuse and Disposal routes



The Use of Sewage Sludge in Agriculture Regulations require an analysis of sewage sludge at least once every six months. The frequency of analysis may then be reduced to yearly where the results of analysis do not vary significantly over a year. Where it is evident that copper and zinc are present only in small or negligible quantities in the waste water treated by the sewage treatment plant, the frequency of analyses for those parameters may be reduced to once in three years. Table 5-9 presents the concentration of heavy metals in sludges reused in agriculture. Where exceedances of the limits are reported the reported result is highlighted. Three results out of the samples tested during the period 2002 and 2003 exceeded the concentration of heavy metals in sludges used in agriculture, namely Zinc at 9500 mg/kg DM (Dundalk), 6300 mg/kg DM (Ringsend) and Cu at 1566 mg/kg DM (Killorglin). The concentrations of the other metals for these three particular samples were within the limit values.

Table 5-9. Maximum Concentration of Heavy Metals in Sludges Reused in Agriculture (2003)

		Cd	Cu	Ni	Pb	Zn	Hg
Limit mg/kg DM		20	1000	300	750	2500	16
PlantName	No. Of Tests	Maximum value recorded (mg/kg DM)					
Athenry	1	0.6	266	11	22	396	1.5
New Nenagh	1	1.0	305	2	66	739	1.4
Ballaghaderreen	1	0.9	399	7	13	266	0.4
Ballybunion	1	1.3	355	9	44	531	0.0
Ballymahon	1	0.7	185	6	10	278	0.5
Boyle	1	1.3	454	8	27	205	0.5
Cahersiveen	1	1.8	425	20	89	482	0.0
Cashel	3	13.0	278	56	17	103	0.5
Castleisland	1	0.0	222	24	81	696	0.1
Castlepollard	1	0.5	73	6	14	314	.5
Castlerea	1	0.5	975	10	70	461	1.1
Charleville	1	0.7	58	13	84	63	0.5
Clonmel	1	0.2	450	21	94	-	0.6
Dingle	1	3.8	212	5	37	-	-
Dundalk	42	1.9	380	147	122	9500	-
Drogheda	2	0.7	373	38	38	277	-
Edgeworthstown	1	0.5	60	3	10	156	0.5
Elphin	1	0.7	407	12	13	452	0.3
Fermoy	1	0.6	106	13	50	79	0.5
Frenchpark	1	1.4	783	18	19	756	0.4
Gort	1	0.4	369	8.2	20	494	0.5
Granard	1	0.5	157	6	12	271	0.5
Kanturk	1	0.5	33	7	48	42	0.5
Kenmare	1	1.7	308	19	52	509	0.0
Kilbeggan	1	0.5	3	1	10	10	0.5
Killarney	1	1.0	318	34	62	-	-
Killorglin	1	3.5	1566	18	57	-	-
Kinnegad	1	0.5	38	2	10	137	0.5
Leitrim	1	-	35	3	9	-	0.1
Leixlip	4	0.5	104	4	6	91	0.4
Listowel	1	1.6	110	10	53		0.1
Longford	1	0.5	63	7	10	163	0.5
Loughrea	1	0.7	417	14	36	444	0.8
Mallow	1	0.5	31	6	52	77	0.5
Moate	1	0.5	13	1	10	24	0.5
Monksland	1	1.8	190	8	7	470	1.7
Mortarstown	1	0.2	37	14	2	57	0.0
Mullingar	1	0.5	93	6	13	301	0.5
Navan	1	1	-	-	18		1
Osberstown	24	0.6	196	183	93	437	1.0
Portlaoise	2	1	-	-	29	-	1

Table 5-9. Maximum Concentration of Heavy Metals in Sludges Reused in Agriculture (2003)(Cont.)

		Cd	Cu	Ni	Pb	Zn	Hg
Limit mg/kg DM		20	1000	300	750	2500	16
PlantName	No. Of Tests	Maximum value recorded (mg/kg DM)					
Portumna	2	0.8	188	21	50	505	0.8
Ringsend	39	2.0	440	78	250	6300	-
Rochfordbridge	1	5	8	1	10	17	0.5
Roscommon	1	5.6	353	26	22	259	1.7
Strokestown	1	0.6	28	2	4	19	0.6
Tuam	1	1	528	18	61	516	0.5
Tralee	1	3.6	433	23	61	417	0.0
Tyrellspass	1	5	73	6	14	314	0.5

The Regulations (Use of Sewage Sludge in Agriculture Regulations, 1998) specify that sludge shall not be used in agriculture where the concentration of one or more of the heavy metals exceeds the values specified. Part III of the Regulations sets out the conditions applying to soil sampling and analysis including the parameters to be analysed. Table 5-10 presents the results of analysis reported to the EPA by local authorities. Due to the large amount of data submitted for metal concentrations in soil where the sludge from the Ringsend sewage treatment plant is used, a separate analysis is presented in Table 5-11 for the Ringsend plant.

Table 5-10. Maximum Concentration of Heavy Metals in Soils where Sludge was Reused in Agriculture (2003)

		Cd	Cu	Ni	Pb	Zn	Hg
Limit mg/kg DM		1	50	30	50	150	1
PlantName	No. Of Tests	Maximum value recorded (mg/kg DM)					
Ballybunion	1	0.7	11	1	0.9	9.2	0.1
Ballybunion	1	1.6	5	2	18	-	-
Cahersiveen	1	0.3	7	1	4	-	-
Kenmare	1	0.2	1	0	11	-	-
Killarney	3	0.5	16	4	14	-	-
Killorglin	7	0.5	26	10	53	-	-
Tralee	2	0.9	5	1	4	-	-
Tuam	9	0.9	23	25	19	47	0.2

The monitoring results indicate that the heavy metal concentrations in the soils tested for sludge application from the treatment plants (Ringsend is dealt with separately) listed in Table 5-10 were within the specified limits except for cadmium in Ballybunion and lead in Killorglin.

The monitoring results for soils used to spread the sludge from the Ringsend treatment plant however show that the limits have been exceeded for all but one metal during the reporting period. In light of these exceedances the EPA

recommends that Dublin City Council review current practice and cease using lands where the metal concentration in the soils exceed the permitted limits.

Table 5-11. Maximum Concentration of Heavy Metals in Soils where Ringsend Sludge was Reused in Agriculture (2002 and 2003).

Metal	Limit mg/kg DM	2002 Results			2003 Results		
		Max Value (mg/kg DM)	No. of Exceedances	No. of tests	Max Value (mg/kg DM)	No. of Exceedances	No. of tests
Cd	1	5	72	903	15	48	744
Cu	50	180	9	900	59	2	744
Ni	30	90	109	888	907	73	740
Pb	50	224	52	856	142	60	740
Zn	150	656	6	902	404	6	743
Hg	1	71	25	875	98	24	705

5.5. EPA AUDITS

The EPA audits local authorities to determine conformity with the Urban Waste Water Treatment Regulations and The Waste Management (Use of Sewage Sludge in Agriculture) Regulations. The criteria used in the audits are:

- Recommendations contained in the Environmental Protection Agency Act, 1992 [Urban Wastewater Treatment] Regulations, 1994: A handbook on the Implementation for Sanitary Authorities;
- Recommendations contained in - Urban Wastewater Treatment: A Report for the Years 1996/97 and 1998/99;
- The Water Pollution Acts 1997-1990; and
- The Waste Management (Use of Sewage Sludge in Agriculture) Regulations, 1998 and The Waste Management (Use of Sewage Sludge in Agriculture) Regulations, Amended Regulations, 2001.

Table 5-12 shows the local authorities which were audited between 2001 and 2004.

The audit procedure consists of an opening meeting, a site inspection, and a closing meeting. At the opening meeting the scope and objectives of the audit and criteria to be used are reviewed. The site inspection is used to review the general operation of a plant including the sampling, analytical and reporting procedures in place. The closing meeting followed the audit is used to present the audit findings. Subsequent to the audit, a report is issued to each authority. This audit report sets out the observations noted during the audit and recommended actions to be taken by the authority concerned. These actions will form part of the criteria to be used in future audits.

The results of the audits indicated that all authorities were aware of their monitoring obligations under the UWWT Regulations. Chapter 10 of the 1997 EPA manual on Primary, Secondary and Tertiary Treatment advised local authorities to use an environmental management systems approach to managing wastewater treatment plants. The audits indicated that such an approach at least in part has been adopted by some of the authorities audited with elements of a management system in place at others.

It was also noted that most laboratories follow documented analytical procedures including quality control protocols. Local authorities who participate successfully in the EPA intercalibration scheme are included on the Register of approved laboratories which may be viewed on the EPA website at;
<http://www.epa.ie/PublicAuthorityServices/LaboratoryIntercalibrationProgramme/>

Table 5-12 Sanitary Authorities Audited During the Period 2001 - 2004

Sanitary Authority	2001	2002	2003	2004²
Carlow County Council		√		√
Cavan County Council			√	
Clare County Council			√	
Cork City Council				√
Cork County Council				√
Donegal County Council		√		√
Dublin City Council				√
Dun Laoghaire Rathdown County Council		√		√
Fingal County Council			√	
Galway City Council				√
Galway County Council		√		√
Kerry County Council				√
Kildare County Council			√	
Kilkenny County Council	√		√	√
Laois County Council				√
Leitrim County Council		√		√
Limerick City Council		√		
Limerick County Council		√		√
Longford County Council			√	√
Louth County Council		√	√	
Mayo County Council		√		√
Meath County Council			√	√
Monaghan County Council		√		√
North Tipperary County Council			√	
Offaly County Council			√	√
Roscommon County Council			√	√
Sligo County Council	√			√
South Dublin County Council				√
South Tipperary County Council		√		
Waterford City Council	√		√	
Waterford County Council	√		√	√
Westmeath County Council	√			√
Wexford County Council	√			√
Wicklow County Council	√		√	
Total	7	11	14	24

There has also been an improvement in the approach to licensing of discharges under the Water Pollution Acts compared with observations made in audits conducted during the previous reporting period (2000/2001). It is recommended that enforcement of these licences should be reviewed regularly with the inclusion of periodic site inspections and environmental audits. At Limerick County Council for example, it was noted that there was a detailed enforcement plan in place for licensed facilities. This plan provided for both monitoring visits for sample collection and detailed environmental audits.

² Audits listed below were carried out to the end of November 2004.

While improvements have been noted, the following is a compilation of other observations made during individual audits. These observations do not apply to all local authorities or all plants audited but illustrate the types of issues that need to be resolved so that best practice becomes the norm in the operation and management of waste water treatment plants:

- an absence of written procedures for the maintenance and calibration of equipment used at some waste water treatment plants;
- insufficient sampling frequency of waste water discharges;
- an absence of sampling procedures at some waste water plants audited;
- absence of Total Phosphorus and Total Nitrogen monitoring for population equivalent greater than 10,000;
- grab sampling employed to determine compliance instead of the mandatory flow proportional or time based 24-hour composite samples;
- information on all agglomerations greater than 500 persons not submitted to the EPA;
- ortho-P determinations used instead of the required Total Phosphorus.
- an absence of a scheduled trade effluent monitoring programme at some local authorities;
- inadequate maintenance of Registers required under the Water Pollution Acts and Use of Sewage Sludge in Agriculture Regulations;
- breaches of discharge licences not pursued by some local authorities; and
- inconsistency between the limits set in trade effluent discharge licences and the follow up enforcement monitoring.

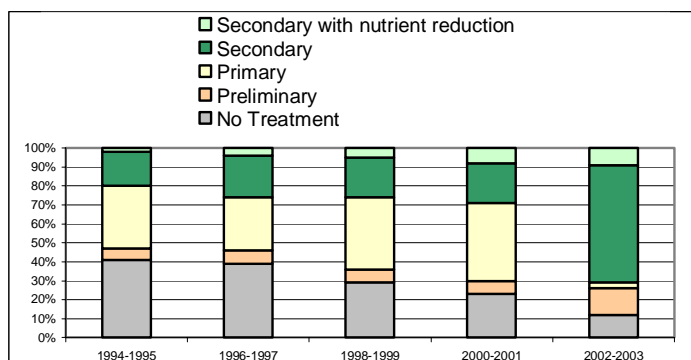
It was also noted at some local authorities that there has been considerable improvement in the implementation of the Regulations and management of the monitoring programme since previous audits by the EPA.

6. ENVIRONMENTAL INDICATORS

The Agency has included in previous reports a series of environmental indicators to monitor trends in the quality of urban waste water discharges and the reuse and disposal routes of sewage sludges. Table 6-1 presents the indicators and their respective values for 2002/2003 as well as corresponding values for 1994/95, 1996/97, 1998/99 and 2000/2001.

The quantity of urban waste water arisings has increased significantly, though much of this is accounted for by improved monitoring at existing plants and more accurate assessments of the population equivalent at new treatment plants in addition to increased economic activity and population growth. The reporting threshold has also been reduced since 1998 to include agglomerations of 500 p.e.

Wastewater Facilities – Level of Treatment (%)



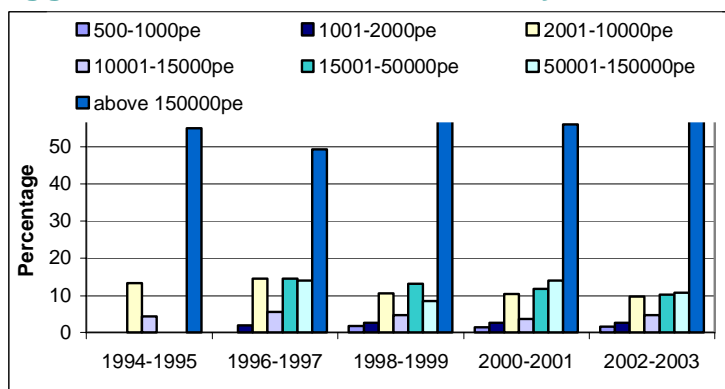
The proportion of wastewater subject to secondary treatment has increased significantly from 21% to 62% since the 2000-2001 period. This is due to the new sewage treatment plant at Ringsend, Dublin. The waste water treated now at Ringsend was previously accounted for in the primary treatment category which has significantly reduced.

The provision of secondary treatment with nutrient reduction continues to increase.

The significant changes since the previous report reflects the overall increasing level of treatment of wastewater in Ireland.

Treatment Type	% Level of Treatment				
	1994-5	1996-7	1998-9	2000-1	2002-3
No Treatment	41	39	29	23	12
Preliminary	6	7	7	7	14
Primary	33	28	38	41	3
Secondary	18	22	21	21	62
Secondary with nutrient reduction	2	4	5	8	9

Agglomeration PE Distribution by Class

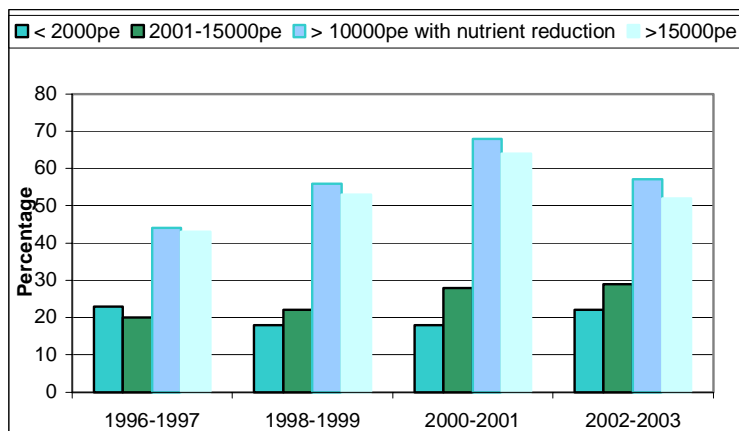


The population equivalent for the largest class i.e. agglomerations >150,000 p.e. has increased since the last reporting period. It is thought that the accuracy of figures has improved in recent years with more precise monitoring of influent to treatment plants and more accurate measurements of population equivalents for agglomerations, which previously had no treatment plants.

There are five agglomerations with a population equivalent greater than 150,000 persons and collectively they represent over 60% of waste water arisings.

Class of Agglomeration (p.e)	Agglomeration Distribution by Class (%)				
	1994-5	1996-7	1998-9	2000-1	2002-3
500 - 1000	-	-	1.9	1.4	1.6
1001 - 2000	-	2	2.7	2.6	2.7
2001 - 10000	13.3	14.5	10.6	10.4	9.8
10001 - 15000	4.4	5.5	4.7	3.7	4.7
15001 - 50000	-	14.6	13.1	11.8	10.2
50001 - 150000	-	14.1	8.6	14.1	10.8
above 150000	55	49.4	58.5	56	60.2

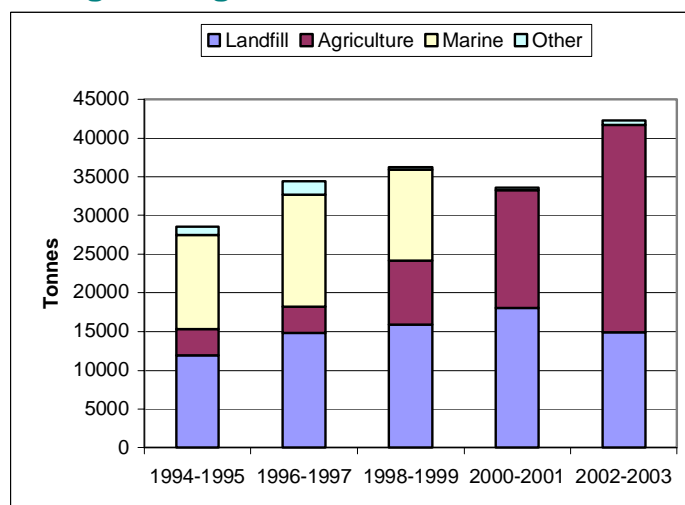
Percentage Compliance by Category



Compliance remains disappointingly low in all categories. Compliance was increasing for all categories until this reporting period where it can be seen that for the two larger p.e. categories, compliance level has reduced. In order to be compliant, adequate sampling must be carried out and the effluent must meet the required standards. A significant number of plants are not taking the required number of effluent samples. Optimum plant operation can also ensure compliance with the required Regulations.

Plant Category	Compliance (%)			
	1996-7	1998-9	2000-1	2002-3
< 2000pe	23	18	18	22
2001-15000pe	20	22	28	29
> 10000pe with nutrient reduction	44	56	68	57
> 15000pe	43	53	64	52

Sewage Sludge End Use



Overall, the amount of sewage sludge generated has increased significantly since the 1994-1995 period.

The use of sewage sludge in agriculture has increased since the last report and now accounts for 63% of the total sludge arisings compared with 45% in 2001/2002 and only 23.2% in 1998/99.

Disposal of sewage sludge to the marine environment ceased in 1998.

Trends in sewage sludge reuse and disposal show a significant increase in the use of sewage sludge in agriculture with a subsequent decrease in disposal to landfill.

Destination	Sewage Sludge (tds)				
	1994-5	1996-7	1998-9	2000-1	2002-3
Landfill	11987	14828	15875	18052	14909
Agriculture	3311	3379	8258	15155	26743
Marine	12187	14483	11782	0	0
Other	1056	1690	320	352	646
Total	28541	34381	36236	33559	42298

Table 6-1: Environmental Indicators for 1994 – 2003

<i>Urban Waste Water</i>	<i>Value for 1994-95*</i>	<i>Value for 1996-97**</i>	<i>Value for 1998-99***</i>	<i>Value for 2000 -01***</i>	<i>Value for 2002 -03***</i>
<i>total p.e. of all discharges</i>	3,992,654	3,913,644	5,101,116	5,493,338	5,802,424
<i>percentage arisings not receiving any form of treatment</i>	41%	39%	29%	23%	18%
<i>percentage arisings receiving preliminary treatment only</i>	6%	7%	7%	7%	13%
<i>percentage arisings receiving primary treatment only</i>	33%	28%	38%	41%	2%
<i>percentage arisings receiving secondary treatment only</i>	18%	22%	21%	21%	58%
<i>percentage arisings receiving nutrient reduction in addition to secondary treatment</i>	2%	4%	5%	8%	9%
<i>percentage arisings discharging to freshwater/estuaries</i>	76%	77%	81%	79%	87%
<i>percentage arisings discharging to coastal waters</i>	24%	23%	19%	21%	13%
<i>percentage discharges from the agglomerations class 500 to 1000 p.e.</i>	-	-	1.9%	1.4%	1.6%
<i>percentage discharges from the agglomerations class 1,001 to 2,000 p.e.</i>	-	2.0%	2.7%	2.6%	2.7%
<i>percentage discharges from the agglomerations class 2,001 to 10,000 p.e.</i>	13.3%	14.5%	10.6%	10.4%	9.8%
<i>percentage discharges from the agglomerations class 10,001 to 15,000 p.e.</i>	4.4%	5.5%	4.7%	3.7%	4.7%
<i>percentage discharges from the agglomerations class 15,001 to 50,000 p.e.</i>	-	14.6%	13.1%	11.8%	10.2%
<i>percentage discharges from the agglomerations class 50,001 to 150,000 p.e.</i>	-	14.1%	8.6%	14.1%	10.8%
<i>percentage discharges from agglomerations above 150,000 p.e.</i>	55%	49.4%	58.5%	56%	60.2%

Table 6.1: Environmental Indicators for 1994 – 2003 (cont.)

<u>Urban Waste Water</u>	Value for 1994-95*	Value for 1996-97**	Value for 1998-99***	Value for 2000-01***	Value for 2002 -03***
<i>Effluent quality standard compliance rate for plants > 15,000 p.e.³</i>	-	43%	53%	64%	52%
<i>Effluent quality standard compliance rate for plants between 2,000 p.e. and 15,000 p.e.²</i>	-	20%	22%	28%	29%
<i>Effluent quality standard compliance rate for plants less than 2,000 p.e.²</i>	-	23%	18%	18%	22%
<i>Effluent quality standard compliance rate for plants > 10,000 p.e. with nutrient reduction discharging to sensitive areas</i>	-	44%	56%	68%	57%
<u>Sewage Sludge</u>					
<i>tonnes of dry solids produced</i>	28,541	34,484	35,595	33,559	42,298
<i>percentage disposed of to landfill/marine/other</i>	42.0/42.7/3.7	43.0/42.0/4.9	44.6/33.1/0.9	53.8/0/1.0	35/0/2
<i>percentage reused in agriculture/forestry/other</i>	11.6/0.0/3.7	9.8/0.0/4.9	23.2/0.0/0.9	45.2/0/1.0	63/0/0
<i>*p.e ≥ 2,000 persons reported</i>	<i>** p.e ≥ 1,000 persons reported</i>		<i>*** p.e ≥ 500 persons reported</i>		

³ An assessment of compliance is not reported for 1994-1995 due incomplete data reported.

7. CONCLUSIONS

This is the fifth report to be prepared on the quality of urban waste water discharges and sewage sludges.

The following is a summary of the main findings:

1. Information on discharges from four hundred and forty three agglomerations with a population equivalent equal to or greater than 500 persons was reported to the EPA for 2003. Sampling of discharges is in many cases inadequate and not in compliance with the requirements of the UWWT Regulations. This requires immediate attention by many local authorities.
2. Two hundred and ninety five of the reported agglomerations had secondary treatment facilities in 2003, treating 66.8% of total wastewater arisings. This compares with 28.8% for the 2000/2001 reporting period.
3. The largest number of agglomerations (141) fall within the 500 – 1,000 population equivalent range though they account for only 1.6% of waste water arisings.
4. The five largest agglomerations (based on population equivalent) Dublin City, Cork City, North Dublin, Dundalk and Killybegs account for almost sixty percent of all waste water arisings.
5. All agglomerations with population equivalents greater than 15,000 were required to have secondary treatment by 31 December 2000. Of the forty agglomerations of 15,000 p.e. or greater only twenty seven of these had secondary treatment installed and operational by that end of the reporting period (31 December 2003).
6. The forty areas to which sensitive status applied, during the reporting period, receive one hundred and fifty five discharges from treatment plants of greater than 500 p.e. Of these, one hundred and twenty seven receive secondary treatment of which twenty seven receive nutrient reduction in addition to secondary treatment.
7. Sampling regimes exist at most secondary waste water treatment plants. In the majority of cases, however, the reference methods for monitoring, as set out in the schedules to the Regulations, are not being rigidly adhered to, particularly the use of grab sampling instead of flow proportional sampling.
8. 13 out of 25 secondary treatment plants serving agglomerations greater than 15,000 p.e. met the effluent quality standards set by the Regulations resulting in a compliance rate of 52% for this class.
9. For plants serving agglomerations greater than 10,000 p.e. and discharging to sensitive areas, 8 out of 14 plants met the standards resulting in a compliance rate of 57%.
10. 30 out of 105 secondary treatment plants serving agglomerations between 2,000 and 15,000 p.e met the effluent quality standards set by the Regulations resulting in a compliance rate of 29% for this class.
11. 35 out of 160 secondary treatment plants serving agglomerations less than 2,000 p.e. met the effluent quality standards set by the Regulations resulting in a compliance rate of 22% for this class.
12. Approximately 63% (45% in 2001) of sludge produced in treatment plants with a p.e. greater than 500 persons is reused in agriculture while 35% is diverted to landfill.
13. Sampling programmes at some local authorities where sewage sludge is reused in agriculture are either non-existent or in need of improvement.

8. Recommendations

Recommendations made throughout the report are summarised in this chapter under the headings of treatment plants and discharges; monitoring and reporting; and sewage sludge. The recommendations are based on an analysis of the urban waste water returns for the year 2002/2003 and audits carried out by the agency during the 2003 and 2004 period. It is considered necessary to repeat the recommendations set out in previous reports as it was found that in some cases they were not being implemented.

8.1. TREATMENT PLANTS AND DISCHARGES

1. Local authorities should review the operation of all urban waste water treatment plants in their functional areas including those below 500 p.e. Corrective action programmes should be developed and implemented for those plants that are failing to meet the effluent quality standards set by the Regulations. Particular priority should be placed on correcting plants whose discharges are causing environmental pollution in the waters to which the effluents discharge. In addition, all other identifiable sources of pollution contributing to the poor quality status of the water body should be dealt with.
2. It is recommended that each local authority review the quality of receiving waters and ensure appropriate treatment is provided, to achieve compliance with other Community Directives. It is also recommended that a detailed review of agglomerations and receiving waters be carried out to assess future needs to secure compliance by the appropriate dates.
3. An environmental management systems approach should be adopted to the management and operation of urban waste water treatment plants to ensure the treatment objectives are met. The management system should address:
 - Organisation and responsibilities of personnel involved in operating the treatment plant;
 - Staff training;
 - Quantification of the environmental effects of the treatment plant;
 - Operational control of the treatment plant;
 - Documentation and maintenance records at the treatment plant;
 - Preventative maintenance;
 - Routine servicing;
 - Emergency response;
 - Equipment replacement;
 - Quantification of inflow to the plant; and
 - Monitoring of outflows.
4. The Regulations require that appropriate treatment be in place by 31 December 2005 for agglomerations with a population equivalent less than 2000 p.e. discharging to freshwaters and estuaries and agglomerations less than 10,000 p.e discharging to coastal waters. The EPA estimates that appropriate treatment should be in place for over 270 of these agglomerations by 31 December 2005. It is therefore recommended that local authorities review the level of treatment provided for each agglomeration and ensure plans are in place to meet the requirements of the Urban Waste Water Regulations. In order to determine what appropriate treatment is required the following should be consulted:
 - Freshwater Fish Directive (78/659/EEC) as implemented by S.I. 293 of 1988;
 - Shellfish Directive (79/923/EEC) as implemented by S.I. 200 of 1994;

- Bathing Water Directive (76/160/EEC) as implemented by S.I. 155 of 1992 and S.I. 230 of 1996;
 - Surface Water Directive (75/440/EEC) as implemented by S.I. 294 of 1989;
 - The relevant Water Quality Management Plan;
 - Memorandum No.1: Technical Committee on Effluent and Water Quality Standards;
 - Agency Handbook on Implementation (of the UWWT Regulations) for Sanitary Authorities;
 - Managing Ireland's Rivers and Lakes - A catchment based Strategy against eutrophication; and
 - Statutory environmental standards.
5. With regard to trade effluent entering collection systems, local authorities should ensure that these discharges are licensed and that appropriate conditions are included in the licences (or revised licences) issued in accordance with the Water Pollution Acts such that:
- The operation and performance of the waste water and sludge treatment plants and their operation is not adversely affected;
 - The resultant sludge can be beneficially reused (if required); and
 - The receiving waters are not adversely affected.

The licensing authority should audit against the licence conditions to ensure that all the requirements of the licence are in compliance and where appropriate enforcement action should be initiated.

The communication of the results of monitoring to licensees should be reviewed. It is advised that the "Recommendation of the European Parliament and of the Council of 4 April 2001 providing for minimum criteria for environmental inspections in the Member States (2001/331/EC)" be considered.

Where the EPA proposes to grant a licence or revised licence which involves a discharge to sewer, the local authority should ensure that consents under the provisions of section 97 of the EPA Act, 1992, and section 52 of the Waste Management Act, 1996 contain similar conditions.

For additional advice on the licensing of industrial discharges local authorities are advised to consult the 1998 EPA publication on the Characterisation of Industrial Waste Waters (EPA, 1998).

8.2. MONITORING AND REPORTING

1. Local authorities should ensure the sampling and analysis is carried out in accordance with the Regulations for all treatment plants including those that are managed and operated by third parties on behalf of the sanitary authority.
2. Local authorities should review their monitoring programmes to ensure that they are fully in compliance with the Regulations and that at least the requisite number of samples are taken.
3. All sampling should be undertaken by competent personnel and all analyses should be carried out by an accredited laboratory or one which is on the EPA Register of approved laboratories.
4. Local authorities should ensure that secondary treatment plants serving a population equivalent of between 500 and 2,000 should have their waste water treatment discharges sampled at least 6 times per year.
5. Sampling and analyses should be carried out using the methods specified in the Regulations. In particular twenty four hour flow proportional samples should be taken in order to monitor compliance with the requirements for discharged waste waters as specified in the Regulations.
6. The maximum average weekly BOD₅ load entering a treatment plant should be determined and this figure used to calculate the population equivalent of the plant. Measurement during heavy rain should be excluded when calculating the population equivalent.

7. Notwithstanding the above, monitoring of the influent should be carried out in conjunction with flow measurements on a regular basis to establish the p.e. of the plant and assist in maintaining the plant at optimum operating conditions and to identify potential problems.
8. For agglomerations with treatment plants between 500 – 2,000 p.e. where a local authority is certain that a discharge from the collecting system consists of domestic waste water without admixture of any other type of waste water, the agglomeration load can be calculated using the total population served and estimates of commercial contributions.
9. All plants with a population equivalent greater than 10,000 p.e should implement monitoring programmes for the influent and effluent analysis of total nitrogen and total phosphorus regardless of whether they discharge to sensitive areas or not.
10. Local authorities should ensure that information on **all** urban waste water treatment plants in their functional area serving agglomerations greater than 500 p.e. is returned to the EPA as part of its annual return.
11. Local authorities should review the performance of all treatment plants under their authority serving communities below 500 p.e. and include these plants on the annual monitoring schedule.
12. There have been significant delays in returns to the EPA by a number of local authorities. This in turn delays the EPA in its work. It is envisaged in the coming year, that this information be provided on-line via a secure link to the EPA website. In future reports, those local authorities that have failed to meet the required deadlines will be named.

For detailed advice on the sampling and monitoring requirements of the Regulations local authorities are advised to consult the EPA publication, “The Environmental Protection Agency Act, 1992, (Urban Waste Water Treatment) Regulations, 1994: A Handbook on Implementation for Sanitary Authorities”.

8.3. SEWAGE SLUDGE

1. An environmental management systems approach should be taken to the application of treated sewage sludge in agriculture, forestry, peatland and other similar outlets. The management system should address as a minimum:
 - Organisation and responsibilities of personnel involved in producing and reusing the treated sludge;
 - Quantification of the environmental effects of the sludge on the environment (including the soil) where the sludge is reused;
 - Control of the sludge storage, holding and spreading operations;
 - Documentation and maintenance of records;
 - Documentation to ensure compliance with recognised standards. (The Waste Management (Use of Sewage Sludge in Agriculture) Regulations, S.I. No. 148 of 1998 and The Waste Management (Use of Sewage Sludge in Agriculture) (Amended) Regulations, S.I. No. 267 of 2001);
 - Preventative maintenance;
 - A monitoring programme;
 - Emergency response.
2. The quantities of sludge generated at urban waste water treatment plants should be recorded and this data used in the preparation of waste management plans. Where a local authority intends to reuse sludge in agriculture, the requirements of the Waste Management (Use of Sewage Sludge in Agriculture) Regulations, S.I. No. 148 of 1998 and The Waste Management (Use of Sewage Sludge in Agriculture) (Amended) Regulations, S.I. No. 267 of 2001 should be implemented.

3. The sludge disposal route should be recorded and where sewage sludge is reused in agriculture (and is not injected or otherwise worked into the land) local authorities should ensure that the sludge is treated prior to reuse.
4. Where sludge is reused in agriculture, the sludge from each waste water treatment plant should be analysed according to the Regulations and reused in accordance with a nutrient management plan.
5. Where sludge from urban waste water treatment plants is reused in agriculture a nutrient management plan should be in place including a detailed analysis of soils, according to the standards prescribed in the Regulations. Where the limit values in the Regulations pertaining to soils are exceeded the practice of reusing sludge in that area should cease.

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Appendix A: Schedules to the Urban Waste Water Treatment Regulations, 2001

S.I. NO 254 of 2001

**ENVIRONMENTAL PROTECTION AGENCY ACT, 1992
(URBAN WASTE WATER TREATMENT REGULATIONS, 2001)**

First Schedule Collecting Systems

A collection system shall take into account waste water treatment requirements.

The design, construction and maintenance of a collecting system shall be undertaken in accordance with the best technical knowledge not entailing excessive costs, regarding;

- volume and characteristics of urban waste water,
- prevention of leaks,
- limitation of pollution of receiving waters due to storm water overflows.

Second Schedule
Part 1

The values for concentration or for the percentage of reduction shall apply.

Parameters	Concentration	Minimum percentage of reduction ⁽¹⁾	Reference method of measurement
Biochemical oxygen demand (BOD ₅ at 20° C) without nitrification ⁽²⁾	25 mg/l O ₂	70 - 90	Homogenised, unfiltered, undecanted sample. Determination of dissolved oxygen before and after five-day incubation at 20° C ± 1° C, in complete darkness. Addition of a nitrification inhibitor.
Chemical oxygen demand (COD)	125 mg/l O ₂	75	Homogenised, unfiltered, undecanted sample. Potassium dichromate
Total suspended solids	35 mg/l	90	<p>- Filtering of a representative sample through a 0.45µm filter membrane. Drying at 105°C and weighing</p> <p>- Centrifuging of a representative sample (for at least five mins with mean acceleration of 2,800 to 3,200 g), drying at least 105°C and weighing</p>
⁽¹⁾ Reduction in relation to the load of influent. ⁽²⁾ The parameter can be replaced by another parameter: total organic carbon (TOC) or total oxygen demand (TOD) if a relationship can be established between BOD ₅ and the substitute parameter.			

Part II

Requirements for discharges from urban waste water treatment plants to sensitive area which are subject to eutrophication. One or both parameters may be applied depending on the local situation. The values for concentration or for the percentage shall apply.

Parameters	Concentration	Minimum percentage of reduction ⁽¹⁾	Reference method of measurement
Total phosphorus	2 mg/l P (10,000 - 100,000 p.e.) 1 mg/l P (more than 100,000 p.e.)	80	Molecular absorption spectrophotometry
Total nitrogen ⁽²⁾	15 mg/l N (10,000 - 100,000 p.e.) ⁽³⁾ 10 mg/l N (more than 100,000 p.e.) ⁽³⁾	70 - 80	Molecular absorption spectrophotometry
⁽¹⁾ Reduction in relation to the load of the influent. ⁽²⁾ Total nitrogen means: the sum of total Kjeldahl-nitrogen (organic N + NH ₃), nitrate (NO ₃) - nitrogen and nitrite (NO ₂) - nitrogen. ⁽³⁾ These values for concentration are annual means as referred to in paragraph 4 (c) of the Fifth Schedule. However, the requirements for nitrogen may be checked using daily averages when it is proved, in accordance with paragraph 1 of that Schedule, that the same level of protection is obtained. In this case, the daily average must not exceed 20 mg/l of total nitrogen for all the samples when the temperature from the effluent in the biological reactor is superior or equal to 12°C. The conditions concerning temperature could be replaced by a limitation on the time of operation to take account of regional climatic conditions.			

**Third Schedule
Sensitive Areas**

Part 1.

Receiving water	Extent of Sensitive Area
River Boyne Co. Meath	6.5 km section downstream of sewage treatment plant outfall at Blackcastle, Navan, Co. Meath.
River Camlin Co. Longford	From sewage treatment plant at Longford to entry into the River Shannon.
River Castlebar Co. Mayo	Downstream of sewage treatment plant outfall at Knockthomas to entry into Lough Cullin.
River Liffey	Downstream of Osberstown sewage treatment plant to Leixlip reservoir, Co. Kildare.
River Nenagh Co. Tipperary	Downstream of sewage treatment plant outfall in Nenagh to entry into Lough Derg.
River Tullamore Co. Offaly	0.5 km section downstream of sewage treatment plant outfall in Tullamore.
Lough Derg on the River Shannon	Whole lake.
Lough Leane Co. Kerry	Whole lake.
Lough Oughter Co. Cavan	Whole lake.
Lough Ree on the River Shannon	Whole lake.

Third Schedule
Sensitive Areas
Part 2

Receiving water	Extent of Sensitive Area
River Blackwater (Monaghan)	From the confluence of the River Shambles to Newmills Bridge.
River Brosna	Downstream of Mullingar sewage outfall [opposite intersection of regional road (R400) with N52 south of Mullingar], to Lough Ennell.
River Cavan	From the bridge at Lisdarn downstream of Cavan Town to the Annalee River confluence.
River Proules	Downstream of Carrickmacross sewage outfall, to confluence with the River Glyde.
River Barrow	Downstream of Portarlinton sewage outfall, to Graiguenamanagh Bridge.
River Triogue	Downstream of Portlaoise sewage outfall, to confluence with the River Barrow.
River Nore	Downstream of Kilkenny sewage outfall, to Inistioge Bridge.
River Hind	Downstream of Roscommon Town sewage outfall, to Lough Ree.
River Suir	Downstream of Clonmel sewage outfall, to Coolnamuck Weir.
Little Brosna River	Downstream of Roscrea sewage outfall below its confluence with the Bunow River, to the bridge near Brosna House.
River Blackwater (Munster)	Downstream of Mallow railway bridge, to Ballyduff Bridge.
Lough Ennell	County Westmeath.
Lough Muckno	County Monaghan.
Lough Monalty	County Monaghan.
Broadmeadow Estuary (Inner)	From the bridge west of Lissenhall (Broadmeadow River) to the railway viaduct.

Third Schedule Sensitive Areas

Part 2 (cont.)

Liffey Estuary	From Islandbridge weir to Poolbeg Lighthouse, including the River Tolka basin and South Bull Lagoon.
Slaney Estuary (Upper)	From Enniscorthy railway bridge to Macmine.
Slaney Estuary (Lower)	From Macmine to Drinagh / Big Island.
Barrow Estuary	From the weir at Bahana Wood to New Ross Bridge.
Suir Estuary (Upper)	From Coolnamuck Weir to Mount Congreve.
Bandon Estuary Upper	From Inishannon Bridge to Kinsale Western Bridge.
Bandon Estuary Lower	Downstream of Kinsale Western Bridge, to Money Point.
Lee Estuary Upper (Tralee)	From Ballymullin Bridge to seaward end of Tralee Ship Canal / Annagh Island.
Feale Estuary Upper	Downstream of Finuge Bridge, to Poulnahaha old Railway Bridge.
Cashen / Feale Estuary	Downstream of Poulnahaha old Railway Bridge, to Moneycashen.
Killybegs Harbour	Killybegs Harbour inside Kane's Rock / Carntullagh Head.
Castletown Estuary	From the weir 130 m downstream St. Johns Bridge (Castletown River) to Pile Light
Blackwater Estuary Upper	From Bullsod Island (1 km downstream Lismore Bridge) to Dromana Ferry.
Blackwater Estuary Lower	Downstream of Dromana Ferry, to near East Point, Youghal Harbour.

Amendment to the above Schedule

(Urban Waste Water Treatment (Amendment) Regulations, 2004)

Lee Estuary/Lough Mahon	From the salmon weir (downstream of the waterworks intake) to Monkstown (excluding North Channel at Great Island).
Blackwater Estuary Lower	Owennacurra Estuary/North Channel – from North Channel (Great Island) upstream of Marloag Point including Owennacurra Estuary upstream to Dungourney river confluence

Fourth Schedule
Industrial Waste Water

Industrial waste water entering collecting systems and urban waste water treatment plants shall be subject to such pre-treatment as is required to:

- protect the health of staff working in collecting systems and treatment plants;
- ensure that collecting systems, waste water treatment plant and associated equipment are not damaged;
- ensure that the operation of a waste water treatment plant and the treatment of sludge is not impeded;
- ensure that the discharges from treatment plants do not adversely affect the environment or prevent receiving waters from complying with other Community Directives;
- ensure that the sludge can be disposed of safely in an environmentally acceptable manner.

Fifth Schedule
Reference methods for emissions and evaluation of results

1. Sanitary authorities shall ensure that a monitoring method is required which corresponds at least with the level of requirements described below.

Alternative methods to those mentioned in paragraphs 2, 3 and 4 may be used provided that it can be demonstrated that equivalent results are obtained.
2. Flow-proportional or time-based 24-hour samples shall be collected at the same well-defined point in the outlet and if necessary in the inlet of the treatment plant, in order to monitor compliance in these regulations.
3. The minimum annual number of samples shall be determined according to the size of the treatment plant and be collected at regular intervals during the year.

Population Equivalent	Number of samples
2,000-9,999	12 samples during the first year. Four samples in subsequent years, if it can be shown that the waste water discharged during the first year complies with the Regulations.; if one sample of the four fails, 12 samples must be taken in the year that follows.
10,000-49,999	12
50,000 or over	24

4. The treated waste water shall be assumed to conform to the relevant parameters if, for each relevant parameter considered individually, samples of the water show that it complies with the relevant parametric value in the following way:
 - (a) for the parameters specified in Part 1 of the second Schedule, a maximum number of samples which are allowed to fail the requirements, expressed in concentrations and/or percentage reductions in Part 1 of the second Schedule, is set out in the Table to this Schedule;
 - (b) for the parameters in Part 1 of the second Schedule expressed in concentrations, the failing samples taken under normal operating conditions must not deviate from the parametric values by more than 100% but, for the parametric value in concentration relating to total suspended solids, deviation of up to 150% may be accepted;
 - (c) for those parameters specified in Part 2 of the second Schedule the annual mean of the samples for each parameter shall conform to the relevant parametric values.
5. Extreme values for the water quality in question shall not be taken into consideration when they are the result of unusual situations such as those due to heavy rain.

Table

Series of samples taken in any one year	Maximum permitted number of samples which fail to conform
4-7	1
8-16	2
17-28	3
29-40	4
41-53	5
54-67	6
68-81	7
82-95	8
96-110	9
111-125	10
126-140	11
141-155	12
156-171	13
172-187	14
188-203	15
204-219	16
220-235	17
236-251	18
252-268	19
269-284	20
285-300	21
301-317	22
318-334	23
335-350	24
351-365	25

Appendix B: The Environmental Protection Agency Act, 1992 (Urban Waste Water Treatment) Regulations, 1994: A Handbook on Implementation for Sanitary Authorities

Recommended Analyses: Non-sensitive Areas

Parameter	INFLUENT	Effluent	RWUS	RWDS	Note(s)
BOD ₅	Yes	Yes	Yes	Yes	-
COD	Yes	Yes	No	[Yes]	a
Total S Solids	[No]	Yes	Yes	[Yes]	b,c

ABBREVIATIONS

RWUS Receiving water above [US] discharge point,

RWDS Receiving water below [DS] discharge point, clear of the mixing zone.

KEY

* With inhibition of nitrification during analysis

[] Denotes a qualified "Yes" or "No".

NOTES

a The COD test is not suited to very clean waters and is not usually carried out on such samples. However, a provision is made in the table for the carrying out of the test on down-stream receiving waters visibly affected by discharge(s).

b In view of the often unpleasant nature of influent samples it is considered that suspended solids measurement need not be mandatory on such samples.

c The measurement of suspended solids in waters of apparent clarity is of little practical value, and it is proposed that their determination be confined to those down-stream samples of receiving water on which it is considered the COD should be determined (see a above).

Recommended Analyses: Sensitive Areas - Rivers

Parameter	INFLUENT	Effluent	RWUS	RWDS	Note(s)
BOD ₅	Yes	Yes	Yes	Yes	-
COD	Yes	Yes	No	[Yes]	a
Total S Solids	[No]	Yes	Yes	[Yes]	
Total Phosphorus	Yes	Yes	Yes	Yes	b,c
Total oxidised Nitrogen	No	Yes	Yes	Yes	d
Total Kjeldhal Nitrogen	Yes	Yes	No	No	d,e
Ammonia	No	No	Yes	Yes	e

ABBREVIATIONS

RWUS Receiving water above [US] discharge point,

RWDS Receiving water below [DS] discharge point, clear of the mixing zone.

KEY

* With inhibition of nitrification during analysis
[] Denotes a qualified "Yes" or "No".

NOTES

- a** The COD test is not suited to very clean waters and is not usually carried out on such samples. However, a provision is made in the table for the carrying out of the test on down-stream receiving waters visibly affected by discharge(s).
- b** In view of the often unpleasant nature of influent samples it is considered that suspended solids measurement need not be mandatory on such samples.
- c** The measurement of suspended solids in waters of apparent clarity is of little practical value, and it is proposed that their determination be confined to those down-stream samples of receiving water on which it is considered the COD should be determined (see a above).
- d** The measurement of nutrients is essential in sensitive areas. Although phosphorus is the key element concerning the eutrophication of fresh waters, nitrogen is very often determined routinely on such waters, hence its recommended inclusion in programmes.
- e** Total Oxidised Nitrogen comprises nitrate and nitrite. The Total Kjeldahl Nitrogen [TKN] determination includes the measurement of ammonia. The measurement of TKN is not particularly suited to unpolluted (or mildly polluted) receiving waters and, accordingly, it is considered that the determination of ammonia instead of TKN on such waters is more practicable.

Recommended Analyses: Sensitive Areas - Lakes

Parameter	INFLUENT	Effluent	LWGA	LWLB	Note(s)
BOD ₅	Yes	Yes	No	No	a
COD	Yes	Yes	No	No	b
Total S Solids	[No]	Yes	No	No	c
Total Phosphorus	Yes	Yes	Yes	Yes	d
Total oxidised Nitrogen	Yes	Yes	Yes	Yes	d
Total Kjeldhal Nitrogen	Yes	Yes	Yes	Yes	d

ABBREVIATIONS

LWGA Lake water in the general area of the discharge

LWLB Lake water in the general body of the lake, in representative area(s) away from immediate influence of discharge.

KEY

*With inhibition of nitrification during analysis
[] Denotes a qualified "Yes" or "No".

NOTES

- a** The BOD test is not a routine determination on lake waters.
- b** The COD test is rarely if ever carried out on lake water samples.
- c** The test for Suspended Solids would be relevant only in cases of significant algal presence, for which the determination of chlorophyll is a more meaningful routine test.
- d** These are the key tests on lake water

Appendix C: Part I - V from Waste Management (Use of Sewage Sludge in Agriculture) Regulations, 1998

S.I. NO 148 OF 1998

Waste Management (Use of Sewage Sludge in Agriculture) Regulations, 1998

SCHEDULE

Part I

Maximum Values for Concentration of Heavy Metals in Soil

Parameters	Maximum Values*	Expression of Results
Cadmium	1	mg/kg of dry matter in a representative sample as defined in Part III of this schedule of soil with a pH of 5-7
Copper	50	
Nickel	30	
Lead	50	
Zinc	150	
Mercury	1	

*Where the pH of the soil is consistently higher than 7, the values may be exceeded by not more than 50%, provided that there is no resulting hazard to human health, the environment, or in particular, ground water.

Part II

Limit Values for Amounts of Heavy Metals Which May be Added Annually to Agricultural Land, Based on a Ten Year Average.

Heavy Metal	Limit Value (kilograms per Hectare per year)
Cadmium	0.05
Copper	7.50
Nickel	3.00
Lead	4.00
Zinc	7.5
Mercury	0.10
Chromium	3.50

Part III

Conditions Applying to soil sampling and analysis

- A soil analysis shall cover:-
 - the parameters included in part 1 of the schedule to this schedule, and
 - pH.
- Samples taken for analysis shall be representative of the soil on the site and shall be made up by mixing together twenty five core samples taken over each area of five hectares or less used for the same agricultural purpose.

3. (a) Except where sludge is used on grassland, samples shall be taken to a depth of twenty five centimetres or the depth of the surface soil if less, provided that such lesser sampling depth is at least ten centimetres.

(b) where sludge is used on grassland, samples shall be taken to a depth of not more than six centimetres.
4. Where sludge is regularly used in agriculture soil shall be analysed at a minimum frequency of once in ten years.

Part IV

Conditions Applying to Sludge Sampling and Analysis

1. A sludge analysis shall cover:-
 - (a) the parameters included in part II of this Schedule, and
 - (b) The following parameters:
 - ⇒ dry matter, organic matter,
 - ⇒ pH,
 - ⇒ nitrogen and phosphorus.
2. Samples of sludge for analysis shall be representative of the sludge production and shall be taken before to the user.
3. Subject to sub-paragraph (a) and (b), sludge other than sludge referred to in paragraph 6 shall be analysed at least once every six months
 - (a) The frequency of sludge analyses may be reduced to once a year where the results of analyses do not vary significantly over a full year.
 - (b) The frequency of sludge analyses shall be increased where changes occur in the characteristics of the waste water being treated.
4. Where it is evident, on the basis of analyses, that copper and zinc are either not present or are present only in negligible quantities in the waste water treated by the sewage treatment plant, the frequency of analyses for those parameters may be reduced to once in three years.
5. A person, other than a local authority, producing sludge for use in agriculture shall not reduce the frequency of analyses under conditions 3 or 4 without the prior approval of the local authority in whose functional area the sludge is produced.
6. In the case of sludge from a septic tank or sewage treatment plant referred to in article 9:-
 - (a) a sludge analysis shall be carried out within six months after the commencement of the use of such sludge in agriculture,
 - (b) the frequency of the sludge analyses may be reduced to not less than once in five years provided that, in the initial analysis, the values for the concentrations of heavy metals are lower than the values shown in Part II of this schedule, and there is no change in the characteristics of the waste water being treated.

Part V

Methods of Analysis

1. Analysis for heavy metals shall be carried out following strong acid digestion.
2. The reference method of analysis shall be atomic absorption spectrometry.

The limit of detection for each metal shall be no greater than 10 % of the maximum value for that metal.

Appendix D: List of Agglomerations, Discharge Locations and Level of Treatment in 2003.

<i>Authority</i>	<i>Agglomeration</i>	<i>PE</i>	<i>Discharge to</i>	<i>Sensitive*</i>	<i>Present Treatment</i>
Carlow	Borris	600	Freshwater(River)	Yes	Secondary treatment only
	Carlow	36000	Freshwater(River)	Yes	Secondary treatment only
	Hacketstown	630	Freshwater(River)	Yes	Secondary treatment only
	Muinebheag	4000	Freshwater(River)	Yes	Secondary treatment only
	Rathvilly	500	Freshwater(River)	Yes	Secondary treatment only
	Tinnahinch	650	Freshwater(River)	Yes	Secondary treatment only
	Tullogh	3900	Freshwater(River)	Yes	Secondary treatment only
Cavan	Bailieborough	1900	Freshwater(River)	Yes	Secondary treatment with nutrient reduction
	Ballinagh	700	Freshwater(River)	No	Secondary treatment only
	Ballyconnell	1200	Freshwater(River)	No	Secondary treatment with nutrient reduction
	Ballyjamesduff	1400	Freshwater(River)	Yes	Secondary treatment with nutrient reduction
	Belturbet	1950	Freshwater(River)	No	Primary treatment only
	Blacklion	600	Freshwater(River)	No	Secondary treatment only
	Cavan	13850	Freshwater(River)	Yes	Secondary treatment with nutrient reduction
	Cootehill	1700	Freshwater(Lake)	No	Secondary treatment with nutrient reduction
	Killeshandra	600	Freshwater(Lake)	No	Secondary treatment only
	Kingscourt	1950	Freshwater(River)	No	Secondary treatment only
	Mullagh	950	Freshwater(River)	No	Secondary treatment only
	Virginia	1400	Freshwater(Lake)	Yes	Secondary treatment with nutrient reduction
Clare	Clarecastle	2500	Estuarine	No	None
	Corofin	500	Freshwater(River)	No	Primary treatment only
	Ennis North	17000	Freshwater(River)	No	Secondary treatment only
	Ennis South	4000	Freshwater(River)	No	Secondary treatment only
	Ennistymon	2000	Freshwater(River)	No	Secondary treatment only
	Inagh	500	Freshwater(River)	No	Secondary treatment only
	Kilkee	1330	Coastal Water	No	None

<i>Authority</i>	<i>Agglomeration</i>	<i>PE</i>	<i>Discharge to</i>	<i>Sensitive*</i>	<i>Present Treatment</i>
Cork City	Kilkishen	750	Freshwater(River)	No	Secondary treatment only
	Killaloe	1200	Freshwater(River)	No	Secondary treatment only
	Kilmihil	640	Freshwater(River)	No	Secondary treatment only
	Kilrush	2600	Coastal Water	No	None
	Lahinch	8400	Freshwater(River)	No	Secondary treatment only
	Lisdoonvarna	2500	Freshwater(River)	No	Secondary treatment only
	Milltown/Malbay	1360	Freshwater(River)	No	Secondary treatment only
	Newmarket on Fergus	1940	Freshwater(Lake)	No	Secondary treatment only
	Quin	600	Freshwater(River)	No	Secondary treatment only
	Scarriff	1300	Freshwater(River)	Yes	Primary treatment only
	Shannon Town	12500	Estuarine	No	Secondary treatment only
	Shannonbanks	1000	Freshwater(River)	No	Primary treatment only
	Sixmilebridge	1500	Freshwater(River)	No	Secondary treatment only
	Tulla	720	Freshwater(River)	No	Secondary treatment only
	Cork city	328000	Estuarine	No	None
Cork (North)	Banteer	550	Freshwater(River)	Yes	Primary treatment only
	Boherbue	600	Freshwater(River)	Yes	Secondary treatment only
	Buttevant	1200	Freshwater(River)	Yes	Secondary treatment only
	Castletownroche	800	Freshwater(River)	Yes	Preliminary treatment only
	Charleville	6415	Freshwater(River)	No	Secondary treatment only
	Churchtown	700	Freshwater(River)	No	Secondary treatment only
	Doneraile	1100	Freshwater(River)	Yes	Secondary treatment only
	Dromahane	850	Freshwater(River)	Yes	Preliminary treatment only
	Fermoy	12960	Freshwater(River)	Yes	Secondary treatment only
	Kanturk	1700	Freshwater(River)	Yes	Secondary treatment only
	Kildorrery	550	Freshwater(River)	Yes	Secondary treatment only
	Mallow	12000	Freshwater(River)	Yes	Secondary treatment only
	Millstreet	1600	Freshwater(River)	Yes	Secondary treatment only
	Mitchelstown	6000	Freshwater(River)	Yes	Secondary treatment only
	Newmarket	1100	Freshwater(River)	Yes	Secondary treatment only

<i>Authority</i>	<i>Agglomeration</i>	<i>PE</i>	<i>Discharge to</i>	<i>Sensitive*</i>	<i>Present Treatment</i>
<i>Cork (South)</i>	Rathcormac	600	Freshwater(River)	No	Secondary treatment only
	Watergrasshill	1500	Freshwater(River)	No	Secondary treatment only
	Ballincollig New	15000	Freshwater(River)	No	Secondary treatment only
	Ballingeary	600	Freshwater(River)	No	Primary treatment only
	Ballymakeera	1800	Freshwater(River)	No	Primary treatment only
	Bandon	6200	Freshwater(River)	Yes	Secondary treatment only
	Blarney	8000	Freshwater(River)	No	Secondary treatment only
	Carrigaline	12000	Estuarine	No	None
	Carrigtohill	4500	Estuarine	No	Secondary treatment only
	Castlemartyr	2000	Freshwater(River)	No	Secondary treatment only
	Cloughroe	600	Freshwater(River)	No	Secondary treatment only
	Cloyne	510	Freshwater(River)	No	Secondary treatment only
	Coachford	600	Freshwater(Lake)	No	Primary treatment only
	Cobh	10000	Coastal Water	No	None
	Crosshaven	2000	Coastal Water	No	Preliminary treatment only
	Dripsey	600	Freshwater(River)	No	Secondary treatment only
	Glanmire/ Riverstown/L. Island	10000	Estuarine	No	Preliminary treatment only
	Innishannon	600	Freshwater(River)	Yes	Primary treatment only
	Killeagh	600	Freshwater(River)	No	Secondary treatment only
	Kinsale	5000	Estuarine	No	Preliminary treatment only
<i>Cork (West)</i>	Macroom	5000	Freshwater(River)	No	Secondary treatment only
	Midleton	10000	Estuarine	No	Secondary treatment only
	Passage/Monkstown	5000	Estuarine	No	None
	Tramore River Valley	37000	Estuarine	No	None
	Youghal	8000	Estuarine	No	None
	Baltimore	1150	Coastal Water	No	Primary treatment only
	Bantry	2700	Coastal Water	No	None
	Castletownbere	1100	Coastal Water	No	None
	Clonakilty	15000	Estuarine	No	Secondary treatment only
	Courtmacsherry	630	Coastal Water	No	Preliminary treatment only

<i>Authority</i>	<i>Agglomeration</i>	<i>PE</i>	<i>Discharge to</i>	<i>Sensitive*</i>	<i>Present Treatment</i>
Dunmanway	1500	Freshwater(River)	No	Secondary treatment only	
	Rosscarbery/ Owenahincha	2500	Coastal Water	No	Primary treatment only
	Schull	1100	Coastal Water	No	Primary treatment only
	Skibbereen	3500	Estuarine	No	None
Donegal	Ardara	1900	Freshwater(River)	No	Primary treatment only
	Ballybofey/ Stranorlar	5100	Freshwater(River)	No	Secondary treatment only
	Ballyliffen	1000	Freshwater(River)	No	Secondary treatment only
	Ballyshannon	3000	Estuarine	No	Primary treatment only
	Buncrana	5500	Coastal Water	No	Primary treatment only
	Bundoran	9000	Coastal Water	No	Preliminary treatment only
	Carndonagh	5200	Freshwater(River)	No	Secondary treatment only
	Carrigart	500	Estuarine	No	Primary treatment only
	Castlefinn	1000	Freshwater(River)	No	Primary treatment only
	Convoy	1500	Freshwater(River)	No	Primary treatment only
	Donegal Town	5800	Freshwater(River)	No	Secondary treatment only
	Downings	1000	Coastal Water	No	Primary treatment only
	Dunfanaghy/ Portnablagh	2000	Coastal Water	No	Primary treatment only
	Dungloe	2000	Freshwater(River)	No	Primary treatment only
	Dunkineeley	1000	Coastal Water	No	Primary treatment only
	Falcarragh	2000	Estuarine	No	Primary treatment only
	Glenties	1000	Freshwater(River)	No	Primary treatment only
	Kilcar	1000	Coastal Water	No	Preliminary treatment only
	Killybegs	400000	Estuarine	Yes	Preliminary treatment only
	Kilmacrennan	500	Freshwater(River)	No	Secondary treatment only
	Letterkenny	22500	Estuarine	No	Secondary treatment only
	Lifford	1550	Freshwater(River)	No	Primary treatment only
	Manorcunningham	1500	Estuarine	No	Primary treatment only
	Milford	2000	Freshwater(River)	No	Secondary treatment only
	Moville	2000	Estuarine	No	Preliminary treatment only

<i>Authority</i>	<i>Agglomeration</i>	<i>PE</i>	<i>Discharge to</i>	<i>Sensitive*</i>	<i>Present Treatment</i>
	Newtowncunningham	1000	Freshwater(River)	No	Secondary treatment only
	Ramelton	1000	Estuarine	No	Primary treatment only
	Raphoe	2000	Freshwater(River)	No	Secondary treatment only
	Rathmullan	2000	Estuarine	No	Primary treatment only
Dublin	North Dublin	400813	Coastal	No	None
City	Ringsend	2186808	Estuarine	Yes	Secondary treatment only
Dun Laoghaire	Coliemore	1000	Coastal Water	No	None
	Corke Abbey	2000	Coastal Water	No	Secondary treatment only
	Shanganagh	65700	Coastal Water	No	Preliminary treatment only
Fingal	Balbriggan	13000	Coastal	No	None
	Loughshinny	700	Coastal	No	Primary treatment only
	Lusk	3000	Estuarine	No	Primary treatment only
	Malahide	14000	Estuarine	Yes	Secondary treatment only
	Portrane	8000	Coastal Water	No	Secondary treatment only
	Rush	7500	Coastal Water	No	None
	Skerries	12500	Coastal Water	No	Primary treatment only
	Swords	46000	Estuarine	Yes	Secondary treatment with nutrient reduction
	Toberburr	640	Freshwater(River)	Yes	Secondary treatment only
Galway (City)	Galway	73000	Coastal Water	No	None
Galway County	Athenry	3639	Freshwater(River)	No	Secondary treatment only
	Ballinasloe	5667	Freshwater(River)	Yes	Secondary treatment with nutrient reduction
	Ballygar	944	Freshwater(River)	Yes	Secondary treatment only
	Clifden	2500	Estuarine	No	Primary treatment only
	Dunmore	890	Freshwater(River)	No	Primary treatment only
	Eyrecourt	720	Freshwater(River)	Yes	Primary treatment only
	Glenamaddy	750	Freshwater(Lake)	No	Primary treatment only
	Gort	4836	Freshwater(River)	No	Secondary treatment only
	Headford	1390	Freshwater(River)	No	Secondary treatment only
	Killimor	500	Freshwater(River)	Yes	Secondary treatment only

<i>Authority</i>	<i>Agglomeration</i>	<i>PE</i>	<i>Discharge to</i>	<i>Sensitive*</i>	<i>Present Treatment</i>
<i>Kerry</i>	Loughrea	4800	Freshwater(River)	No	Secondary treatment only
	Mountbellew	1033	Freshwater(River)	Yes	Secondary treatment only
	Moycullen	600	Freshwater(River)	No	Secondary treatment only
	Oughterard	2184	Freshwater(River)	No	Secondary treatment only
	Portumna	2842	Freshwater(Lake)	Yes	Primary treatment only
	Tuam	13250	Freshwater(River)	No	Secondary treatment with nutrient reduction
	Ardfert	1000	Freshwater(River)	No	Secondary treatment only
	Ballybunion	4725	Estuarine	Yes	Secondary treatment only
	Ballyduff	800	Freshwater(River)	Yes	Primary treatment only
	Ballyferriter	500	Estuarine	No	Primary treatment only
	Ballyheigue	2222	Coastal	No	Secondary treatment only
	Ballylongford	900	Estuarine	No	Primary treatment only
	Cahersiveen	4502	Coastal Water	No	Secondary treatment only
	Castleisland	6650	Freshwater(River)	No	Secondary treatment only
	Dingle	8600	Estuarine	No	Secondary treatment only
	Fenit	1000	Coastal Water	No	Primary treatment only
	Glenbeigh	1900	Freshwater(Lake)	No	Primary treatment only
	Kenmare	9100	Freshwater(River)	No	Secondary treatment only
	Killarney	32814	Freshwater(Lake)	Yes	Secondary treatment with nutrient reduction
	Killorglin	3776	Freshwater(River)	No	Secondary treatment only
	Listowel	9861	Freshwater(River)	Yes	Secondary treatment only
	Rathmore	1200	Freshwater(River)	No	Secondary treatment only
	Sneem	900	Estuarine	No	Primary treatment only
	Tarbert	1400	Estuarine	No	Primary treatment only
	Tralee	24633	Coastal Water	No	Secondary treatment only
	Waterville	2000	Coastal Water	No	Primary treatment only
<i>Kildare</i>	Athy	11000	Freshwater(River)	Yes	Secondary treatment only
	Ballymore Eustace	1000	Freshwater(River)	Yes	Primary treatment only
	Brownstown	1500	Freshwater(Lake)	No	Primary treatment only

<i>Authority</i>	<i>Agglomeration</i>	<i>PE</i>	<i>Discharge to</i>	<i>Sensitive*</i>	<i>Present Treatment</i>
Kilkenny	Castledermot	1500	Freshwater(River)	Yes	Primary treatment only
	Coill Dubh	800	Freshwater(River)	Yes	Secondary treatment with nutrient reduction
	Derrinturn	500	Freshwater(River)	No	Secondary treatment only
	Kildare Town	4735	Freshwater(River)	No	Secondary treatment only
	Kilmeague	700	Freshwater(River)	No	Secondary treatment only
	Leixlip	64539	Freshwater(River)	Yes	Secondary treatment with nutrient reduction
	Monasterevin	2500	Freshwater(River)	Yes	Primary treatment only
	Nurney	500	Freshwater(River)	Yes	Secondary treatment only
	Osberstown	66100	Freshwater(River)	Yes	Secondary treatment with nutrient reduction
	Rathangan	2000	Freshwater(River)	Yes	Secondary treatment only
	Robertstown	1000	Freshwater(River)	Yes	Secondary treatment only
	Suncroft	500	Freshwater(River)	No	Primary treatment only
	Abbey Park	580	Estuarine	No	Primary treatment only
	Ballyragget	900	Freshwater(River)	Yes	Primary treatment only
	Bennettsbridge	600	Freshwater(River)	Yes	Primary treatment only
	Callan	2500	Freshwater(River)	Yes	Secondary treatment only
	Castlecomer	1750	Freshwater(River)	Yes	Secondary treatment only
	Clogh - Moneenroe	650	Freshwater(River)	Yes	Secondary treatment only
	Freshford	900	Freshwater(River)	Yes	Primary treatment only
	Gowran	600	Freshwater(River)	No	Secondary
	Graignamanagh	950	Freshwater(River)	Yes	Primary treatment only
	Kilkenny City and Environs	110000	Freshwater(River)	Yes	Secondary treatment only
	Mooncoin	900	Estuarine	Yes	Primary treatment only
	Piltown	900	Estuarine	Yes	Secondary treatment only
	Thomastown	2500	Freshwater(River)	Yes	Primary treatment only
	Urlingford	900	Freshwater(River)	Yes	Primary treatment only
	Waterford City Environs	4000	Freshwater(River)	No	None

<i>Authority</i>	<i>Agglomeration</i>	<i>PE</i>	<i>Discharge to</i>	<i>Sensitive*</i>	<i>Present Treatment</i>
Laois	Abbeyleix	2172	Freshwater(River)	Yes	Secondary treatment only
	Ballinakill	500	Freshwater(River)	Yes	Secondary treatment only
	Ballylinan	644	Freshwater(River)	Yes	Secondary treatment only
	Borris-in-Ossory	654	Freshwater(River)	Yes	Secondary treatment only
	Castletown	500	Freshwater(River)	Yes	Secondary treatment only
	Clonaslee	789	Freshwater(River)	Yes	Primary treatment only
	Durrow	860	Freshwater(River)	Yes	Primary treatment only
	Mountmellick	4500	Freshwater(River)	Yes	Secondary treatment only
	Mountrath	1964	Freshwater(River)	Yes	Secondary treatment only
	Portarlinton	5000	Freshwater(River)	Yes	Secondary treatment only
	Portlaoise	23000	Freshwater(River)	Yes	Secondary treatment with nutrient reduction
	Rathdowney	1668	Freshwater(River)	Yes	Secondary treatment only
	Stradbally	2172	Freshwater(River)	Yes	Primary treatment only
Leitrim	Ballinamore	1380	Freshwater(River)	Yes	Secondary treatment with nutrient reduction
	Carrick on Shannon	4302	Freshwater(River)	Yes	Secondary treatment only
	Carrigallen	501	Freshwater(Lake)	No	Secondary treatment only
	Dromahair	620	Freshwater(River)	No	Secondary treatment only
	Drumshanbo	960	Freshwater(Lake)	Yes	Secondary treatment only
	Kinlough	700	Freshwater(River)	No	Secondary treatment only
	Leitrim Village	501	Freshwater(River)	Yes	Secondary treatment only
	Manorhamilton	1650	Freshwater(River)	No	Secondary treatment only
Limerick (City)	Mohill	1398	Freshwater(River)	No	Secondary treatment only
	Limerick	56000	Estuarine	No	None
Limerick County	Abbeyfeale	1500	Freshwater(River)	No	Secondary treatment with nutrient reduction
	Adare	1600	Estuarine	No	Secondary treatment only
	Askeaton	1024	Estuarine	No	Secondary treatment only
	Athea	592	Freshwater(River)	No	Secondary treatment only
	Ballykeeffe	25500	Estuarine	No	Preliminary treatment only
	Bruff	1200	Freshwater(River)	No	Secondary treatment only

<i>Authority</i>	<i>Agglomeration</i>	<i>PE</i>	<i>Discharge to</i>	<i>Sensitive*</i>	<i>Present Treatment</i>
<i>Longford</i>	Cahercornlish	800	Freshwater(River)	No	Secondary treatment only
	Caherdavin	5600	Estuarine	No	No Treatment
	Cappamore	860	Freshwater(River)	No	Secondary treatment only
	Castleconnell	1300	Freshwater(River)	No	Secondary treatment only
	Castletroy	13000	Freshwater(River)	No	Secondary treatment only
	Croom	1200	Freshwater(River)	No	Secondary treatment only
	Doon	700	Freshwater(River)	No	Secondary treatment only
	Dromcollagher	500	Freshwater(River)	No	Secondary treatment only
	Foynes	558	Estuarine	No	No Treatment
	Glin	1386	Estuarine	No	No Treatment
	Hospital	1000	Freshwater(River)	No	Secondary treatment only
	Kilfinnane	900	Estuarine	No	Secondary treatment only
	Kilmallock	2400	Freshwater(River)	No	Secondary treatment only
	Murroe	500	Freshwater(River)	No	Secondary treatment only
	Newcastle West	6100	Freshwater(River)	No	Secondary treatment with nutrient reduction
	Oola	500	Freshwater(River)	No	Secondary treatment only
	Pallaskenry	550	Estuarine	No	No Treatment
	Patrickswell	1500	Freshwater(River)	No	Secondary treatment only
	Rathkeale	2000	Freshwater(River)	No	Secondary treatment with nutrient reduction
	Ballymahon	2118	Freshwater(River)	Yes	Secondary treatment only
	Drumlish	1500	Freshwater(River)	Yes	Secondary treatment only
<i>Louth</i>	Edgeworthstown	3000	Freshwater(River)	Yes	Secondary treatment only
	Granard	3200	Freshwater(River)	Yes	Secondary treatment only
<i>Louth</i>	Lanesboro	1000	Freshwater(River)	Yes	Primary treatment only
	Longford	20000	Freshwater(River)	Yes	Secondary treatment only
	Newtownforbes	1000	Freshwater(River)	Yes	Secondary treatment only
	Ardee	4900	Freshwater(River)	No	Secondary treatment only
	Blackrock	4500	Estuarine	No	Secondary treatment only

<i>Authority</i>	<i>Agglomeration</i>	<i>PE</i>	<i>Discharge to</i>	<i>Sensitive*</i>	<i>Present Treatment</i>
Mayo	Carlingford	500	Coastal Water	No	Secondary treatment only
	Castlebellingham	1000	Freshwater(River)	No	Secondary treatment only
	Clogherhead	1100	Coastal Water	No	Secondary treatment only
	Drogheda	56000	Estuarine	No	Secondary treatment only
	Dromiskin	1200	Freshwater(River)	No	Secondary treatment only
	Dundalk	179535	Estuarine	No	Secondary treatment only
	Dunleer	1200	Freshwater(River)	No	Secondary treatment only
	Louth Village	550	Freshwater(River)	No	Secondary treatment only
	Tullyallen	500	Freshwater(River)	No	Secondary treatment only
	Achill Island Central	4000	Coastal Water	No	Secondary treatment only
	Achill Sound	800	Coastal Water	No	None
	Ballina	16000	Estuarine	No	Secondary treatment only
	Ballindine	500	Freshwater(River)	No	Secondary treatment only
	Ballinrobe	5000	Freshwater(River)	No	Secondary treatment with nutrient reduction
	Ballycastle	600	Freshwater(River)	No	Secondary treatment only
	Ballyhaunis	4000	Freshwater(River)	No	Secondary treatment with nutrient reduction
	Bangor Erris	1000	Freshwater(River)	No	Secondary treatment only
	Belcarra	500	Freshwater(River)	No	Secondary treatment only
	Belmullet	2250	Coastal Water	No	None
	Bohola	650	Freshwater(River)	No	Secondary treatment only
	Castlebar	20000	Freshwater(River)	Yes	Secondary treatment with nutrient reduction
	Charlestown	1100	Freshwater(River)	No	Secondary treatment only
	Claremorris	5500	Freshwater(Lake)	No	Secondary treatment only
	Cong	1500	Freshwater(Lake)	No	Secondary treatment with nutrient reduction
	Crossmolina	2000	Freshwater(River)	No	Secondary treatment only
	Doogort	500	Coastal	No	Primary treatment only
	Foxford	1800	Freshwater(River)	No	Secondary treatment only
	Kilkelly	800	Freshwater(River)	No	Secondary treatment only
	Killala	1500	Coastal Water	No	None

<i>Authority</i>	<i>Agglomeration</i>	<i>PE</i>	<i>Discharge to</i>	<i>Sensitive*</i>	<i>Present Treatment</i>
	Kiltimagh	2000	Freshwater(River)	No	Primary treatment only
	Knock	2000	Freshwater(River)	No	Secondary treatment only
	Louisborough	700	Freshwater(River)	No	Primary treatment only
	Mallaranny	800	Coastal Water	No	Secondary treatment only
	Newport	800	Estuarine	No	Primary treatment only
	Old Head	500	Estuarine	No	Secondary treatment only
	Shrute	500	Estuarine	No	Secondary treatment only
	Swinford	5000	Freshwater(River)	No	Secondary treatment with nutrient reduction
	Westport	20000	Coastal Water	No	Secondary treatment with nutrient reduction
<i>Meath</i>	Athboy	2500	Freshwater(River)	Yes	Secondary treatment only
	Ballivor	500	Freshwater(River)	Yes	Secondary treatment only
	Donore	500	Freshwater(River)	No	Secondary treatment only
	Drumconrath	600	Freshwater(River)	No	Secondary treatment only
	Duleek	2500	Freshwater(River)	No	Secondary treatment only
	Dunshaughlin	4000	Freshwater(River)	Yes	Secondary treatment only
	Enfield	1800	Freshwater(River)	Yes	Secondary treatment only
	Julianstown	500	Freshwater(River)	No	Secondary treatment only
	Kells	5500	Freshwater(River)	Yes	Secondary treatment only
	Kilmessan	500	Freshwater(River)	Yes	Secondary treatment only
	Laytown	2500	Estuarine	No	Secondary treatment only
	Longwood	700	Freshwater(River)	Yes	Secondary treatment only
	Mornington	6000	Estuarine	No	Preliminary treatment only
	Navan	25000	Freshwater(River)	Yes	Secondary treatment only
	Oldcastle	1400	Freshwater(River)	Yes	Secondary treatment only
	Slane	1500	Freshwater(River)	No	Secondary treatment only
	Stamullen	1800	Freshwater(River)	No	Secondary treatment only
	Summerhill	700	Freshwater(River)	Yes	Secondary treatment only
	Trim	7500	Freshwater(River)	Yes	Secondary treatment with nutrient

<i>Authority</i>	<i>Agglomeration</i>	<i>PE</i>	<i>Discharge to</i>	<i>Sensitive*</i>	<i>Present Treatment</i>
<i>Monaghan</i>	Ballybay	4528	Freshwater(River)	No	Secondary treatment only
	Carrickmacross	12087	Freshwater(River)	Yes	Secondary treatment with nutrient reduction
	Castleblayney	12920	Freshwater(Lake)	Yes	Secondary treatment with nutrient reduction
	Clones	3893	Freshwater(River)	No	Secondary treatment only
	Emyvale	764	Freshwater(River)	No	Secondary treatment only
	Glaslough	966	Freshwater(River)	No	Secondary treatment only
	Inniskeen	968	Freshwater(River)	Yes	Secondary treatment only
	Monaghan	30497	Freshwater(River)	Yes	Secondary treatment with nutrient reduction
	Newbliss	1056	Freshwater(River)	No	Secondary treatment only
	Rockorrey	916	Freshwater(River)	No	Primary treatment only
	Scotstown	528	Freshwater(River)	Yes	Secondary treatment only
	Smithboro	1466	Freshwater(River)	No	Secondary treatment only
<i>Offaly</i>	Banagher	1300	Freshwater(River)	Yes	Secondary treatment only
	Birr	8500	Freshwater(River)	Yes	Secondary treatment with nutrient reduction
	Clara	3000	Freshwater(River)	Yes	Primary treatment only
	Cloghan	550	Freshwater(River)	Yes	Secondary treatment only
	Daingean	700	Freshwater(River)	No	Secondary treatment only
	Edenderry	6750	Freshwater(River)	Yes	Secondary treatment only
	Ferbane	1500	Freshwater(River)	Yes	Primary treatment only
	Kilcormac	1400	Freshwater(River)	Yes	Secondary treatment only
	Tullamore	15000	Freshwater(River)	Yes	Secondary treatment with nutrient reduction
<i>Roscommon</i>	Ballaghaderreen	1417	Freshwater(River)	Yes	Secondary treatment only
	Ballinlough	1200	Freshwater(River)	No	Secondary treatment only
	Boyle	6300	Freshwater(River)	Yes	Secondary treatment only
	Castlerea	3411	Freshwater(River)	Yes	Secondary treatment only
	Elphin	800	Freshwater(River)	Yes	Secondary treatment only
	Frenchpark	500	Freshwater(River)	Yes	Secondary treatment only
	Hodson Bay	517	Freshwater(Lake)	Yes	Secondary treatment only

<i>Authority</i>	<i>Agglomeration</i>	<i>PE</i>	<i>Discharge to</i>	<i>Sensitive*</i>	<i>Present Treatment</i>
Sligo	Knockcroghery	550	Freshwater(River)	Yes	Secondary treatment only
	Monksland	5983	Freshwater(River)	Yes	Secondary treatment only
	Roscommon	10667	Freshwater(River)	Yes	Secondary treatment only
	Strokestown	1000	Freshwater(River)	Yes	Secondary treatment only
	Ballisadare	1631	Estuarine	No	Secondary treatment only
	Ballymote	2468	Freshwater(River)	No	Primary treatment only
	Cliffoney	847	Freshwater(River)	No	Primary treatment only
	Collooney	1456	Freshwater(River)	No	Secondary treatment only
	Easkey	630	Freshwater(River)	No	Secondary treatment only
	Enniscrone	2727	Coastal Water	No	Secondary treatment only
	Grange	578	Freshwater(River)	No	Secondary treatment only
	Gurteen	571	Freshwater(River)	No	Secondary treatment only
	Mullaghmore	1306	Coastal	No	Primary treatment only
	Rosses Point	1498	Coastal Water	No	Primary treatment only
	Sligo	20000	Estuarine	No	None
Tipperary (North)	Strandhill	2090	Coastal Water	No	Secondary treatment only
	Tubbercurry	2335	Freshwater(River)	No	Secondary treatment only
	Ballina	2500	Freshwater(Lake)	Yes	Secondary treatment with nutrient reduction
	Borrisokane	700	Freshwater(River)	Yes	Secondary treatment only
	Borrisoleigh	1000	Freshwater(River)	Yes	Secondary treatment only
	Cloughjordan	500	Freshwater(River)	Yes	Secondary treatment only
	Holycross	500	Freshwater(River)	Yes	Secondary treatment only
	Littleton	700	Freshwater(River)	Yes	Secondary treatment only
	Nenagh	18000	Freshwater(River)	Yes	Secondary treatment with nutrient reduction
	Newport	700	Freshwater(River)	No	Secondary treatment only
	Roscrea	14000	Freshwater(River)	Yes	Secondary treatment only
	Templemore	5000	Freshwater(River)	Yes	Primary treatment only
	Thurles	10600	Freshwater(River)	Yes	Secondary treatment only

Authority	Agglomeration	PE	Discharge to	Sensitive*	Present Treatment	
Tipperary (South)	Twomile Borris	600	Freshwater(River)	No	Primary treatment only	
	Ardfinnan	572	Freshwater(River)	Yes	Primary treatment only	
	Cahir	3000	Freshwater(River)	Yes	Secondary treatment only	
	Cappawhite	533	Freshwater(River)	Yes	Primary treatment only	
	Carrick-on-Suir	6000	Freshwater(River)	Yes	Preliminary treatment only	
	Cashel	2280	Freshwater(River)	Yes	Secondary treatment only	
	Clonmel	40000	Freshwater(River)	Yes	Secondary treatment only	
	Fethard	1920	Freshwater(River)	Yes	Secondary treatment only	
	Killenaule	864	Freshwater(River)	Yes	Secondary treatment only	
Waterford City	Tipperary Town	4750	Freshwater(River)	Yes	Secondary treatment only	
	Viewmount,	3500	Estuarine	No	Primary treatment only	
	Waterford City	135000	Estuarine	No	Preliminary treatment only	
Waterford County	Williamstown,	2200	Estuarine	No	Primary treatment only	
	Ardmore	500	Coastal	No	None	
	Cappoquin	950	Freshwater(River)	No	None	
	Dungarvan	10000	Estuarine	No	None	
	Dunmore East	1600	Estuarine	No	None	
	Kilmacthomas	600	Freshwater(River)	No	None	
	Lismore	1000	Freshwater(River)	Yes	Secondary treatment only	
	Portlaw	1250	Freshwater(River)	Yes	Secondary treatment only	
	Ring/ Helvick/Ballinagoul	600	Coastal Water	No	None	
	Tallow	1450	Freshwater(River)	No	None	
	Tramore	15300	Coastal Water	No	None	
	Westmeath	Athlone	22500	Freshwater(River)	Yes	Secondary treatment with nutrient reduction
		Ballynacarrigy	500	Freshwater(River)	No	Secondary treatment only
		Castlepollard	1800	Freshwater(River)	Yes	Secondary treatment with nutrient reduction
		Clonmellon	500	Freshwater(River)	No	Secondary treatment only

<i>Authority</i>	<i>Agglomeration</i>	<i>PE</i>	<i>Discharge to</i>	<i>Sensitive*</i>	<i>Present Treatment</i>
Wexford	Delvin	750	Freshwater(River)	Yes	Secondary treatment only
	Kilbeggan	2000	Freshwater(River)	Yes	Secondary treatment only
	Killucan	700	Freshwater(River)	Yes	Secondary treatment only
	Kinnegad	2500	Freshwater(River)	Yes	Secondary treatment only
	Moate	5000	Freshwater(River)	Yes	Secondary treatment only
	Mullingar	21500	Freshwater(River)	Yes	Secondary treatment with nutrient reduction
	Rochfortbridge	2700	Freshwater(River)	No	Secondary treatment only
	Tyrellspass	1400	Freshwater(River)	Yes	Secondary treatment only
	Adamstown	535	Freshwater(River)	No	Primary treatment only
	Blackwater	1200	Freshwater(River)	No	Secondary treatment only
	Bridgetown	500	Freshwater(River)	Yes	Secondary treatment only
	Buncloody	1800	Freshwater(River)	Yes	Primary treatment only
	Campile	500	Estuarine	No	Primary treatment only
	Castlebridge	1000	Estuarine	Yes	Secondary treatment only
	Clonroche	1000	Freshwater(River)	No	Secondary treatment only
	Courtown/ Riverchapel	10000	Coastal Water	No	Secondary treatment only
	Duncannon	600	Estuarine	No	None
	Enniscorthy	8500	Estuarine	Yes	Secondary treatment only
	Ferns	1200	Freshwater(River)	Yes	Secondary treatment only
	Fethard-on-Sea	1000	Estuarine	No	Primary treatment only
	Gorey	6500	Freshwater(River)	No	Secondary treatment only
	Kilmore Quay	2000	Coastal	No	None
	Kilmuckridge	1000	Freshwater(River)	No	Secondary treatment only
	New Ross	10000	Estuarine	No	None
	Piercetown	600	Freshwater(River)	Yes	Secondary treatment with nutrient reduction
	Rosslare Harbour	3000	Coastal Water	No	Preliminary treatment only
	Rosslare Strand	4000	Coastal Water	No	Secondary treatment only
	Taghmon	1000	Freshwater(River)	No	Secondary treatment only nutrient reduction

<i>Authority</i>	<i>Agglomeration</i>	<i>PE</i>	<i>Discharge to</i>	<i>Sensitive*</i>	<i>Present Treatment</i>
Wicklow	Wexford town	17000	Estuarine	No	Secondary treatment with nutrient reduction
	Arklow	15000	Freshwater(River)	No	None
	Ashford	1000	Freshwater(River)	No	Secondary treatment only
	Aughrim	750	Freshwater(River)	No	Primary treatment only
	Avoca	500	Freshwater(River)	No	Primary treatment only
	Baltinglass	3000	Freshwater(River)	Yes	Secondary treatment only
	Blessington	1900	Freshwater(Lake)	No	Secondary treatment only
	Bray	40000	Coastal Water	No	Preliminary treatment only
	Carnew	1200	Freshwater(River)	No	Secondary treatment only
	Dunlavin Milltown	500	Freshwater(River)	No	Secondary treatment only
	Enniskerry	1800	Freshwater(River)	No	Secondary treatment only
	Greystones	13000	Coastal Water	No	Secondary treatment only
	Kilcoole	2400	Freshwater(River)	No	Secondary treatment only
	Kilpedder	600	Freshwater(River)	No	Secondary treatment only
	Newcastle	1000	Freshwater(River)	No	Secondary treatment only
	Newtownmountkenedy	2500	Freshwater(River)	No	Primary treatment only
	Rathdrum	1500	Freshwater(River)	No	Primary treatment only
	Rathnew	1530	Freshwater(River)	No	Primary treatment only
	Tinahely	900	Freshwater(River)	No	Primary treatment only
	Wicklow	8500	Coastal Water	No	Preliminary treatment only

* The outflow discharges to a sensitive area or the catchment of a sensitive area

Appendix E1: Effluent quality from secondary waste water treatment plants in 2002

Plant name and population equivalent	BOD			COD			TSS		
	No. of samples	No. of samples >25 mg/l	No. of samples >50 mg/l	No. of samples	No. of samples >125 mg/l	No. of samples >250 mg/l	No. of samples	No. of samples >35 mg/l	No. of samples >87.5 mg/l
Carlow County Council									
From 500 to 999 P.E.									
Rathvilly	1	1	1	1	1	1	1	1	0
From 2,000 to 10,000 P.E.									
Muinebheag	19	1	0	35	0	0	35	2	0
From 15,001 to 50,000									
Mortarstown	19	8	3	27	4	3	27	4	3
Cavan County Council									
From 500 to 999 P.E.									
Blacklion	5	0	0	5	0	0	5	0	0
Mullagh	3	1	1	2	1	0	4	2	1
Ballinagh	3	2	0	3	0	0	3	1	0
Killeshandra	1	1	0	1	0	0	1	0	0
From 1,000 to 1,999 P.E.									
Bailieborough	11	1	0	10	0	0	10	0	0
Ballyconnell	0	0	0	1	0	0	0	0	0
Kingscourt	13	6	1	12	0	0	11	4	1
From 2,000 to 10,000 P.E.									
Virginia	5	0	0	2	0	0	3	1	0
Cootehill	12	0	0	11	0	0	10	0	0
Ballyjamesduff	9	0	0	9	0	0	8	0	0
From 10,001 to 15,000									
Cavan	10	1	0	11	0	0	10	0	0
Clare County Council									
From 500 to 999 P.E.									
Inagh	10	2	1	10	1	1	10	5	2
Kilmihil	6	1	0	7	2	1	7	2	1
Quin	6	1	0	7	0	0	7	0	0
Tulla	4	1	1	5	2	1	5	3	1
From 1,000 to 1,999 P.E.									
Lisdoonvarna	5	2	2	8	1	0	6	3	0
Milltown/ Malbay	9	6	2	9	0	0	9	2	0
Lahinch	9	4	2	9	2	2	9	4	2
Sixmilebridge	11	0	0	11	0	0	11	0	0
From 2,000 to 10,000 P.E.									
Clareabbey	11	0	0	11	0	0	11	2	0
Ennistimon	5	4	2	6	2	1	6	5	1
Newmarket on Fergus	7	1	0	7	0	0	8	0	0
From 10,001 to 15,000									
Tradaree	0	0	0	6	1	0	5	3	1
From 15,001 to 50,000									
Clonroadmore	12	0	0	12	0	0	12	0	0

Plant name and population equivalent	BOD			COD			TSS		
	No. of samples	No. of samples >25 mg/l	No. of samples >50 mg/l	No. of samples	No. of samples >125 mg/l	No. of samples >250 mg/l	No. of samples	No. of samples >35 mg/l	No. of samples >87.5 mg/l
Cork County North									
From 500 to 999 P.E.									
Kildorrery	7	6	2	7	4	2	6	3	2
Rathcormac	6	1	1	6	1	1	6	1	1
Boherbue	3	0	0	3	0	0	3	1	0
From 1,000 to 1,999 P.E.									
Kanturk	6	0	0	7	0	0	7	0	0
Millstreet	4	0	0	4	0	0	4	0	0
Doneraile	6	6	6	7	7	6	7	7	7
Watergrasshill	4	1	0	5	0	0	5	1	0
Buttevant	8	8	5	8	5	2	8	6	1
Newmarket	8	4	2	9	2	1	9	5	1
From 2,000 to 10,000 P.E.									
Charleville	5	0	0	6	0	0	6	0	0
Mitchelstown	10	2	0	10	1	0	10	5	0
From 10,001 to 15,000									
Fermoy	12	0	0	12	0	0	11	0	0
From 15,001 to 50,000									
Mallow	13	0	0	13	0	0	13	1	0
Cork County South									
From 500 to 999 P.E.									
Cloughroe	4	3	3	4	3	1	4	3	1
Cloyne	3	0	0	3	0	0	3	0	0
Dripsey	3	1	1	4	1	1	4	2	1
From 2,000 to 10,000 P.E.									
Bandon	12	0	0	12	0	0	12	0	0
Carrigtohill	13	4	2	13	4	2	13	5	2
Castlemartyr	5	0	0	5	0	0	4	0	0
Macroom	7	0	0	7	0	0	7	1	0
Midleton	11	0	0	12	0	0	12	0	0
Blarney	9	0	0	11	0	0	11	0	0
From 10,001 to 15,000									
Ballincollig New	14	0	0	14	0	0	14	0	0
Cork County West									
From 1,000 to 1,999 P.E.									
Dunmanway	6	6	3	7	4	1	7	6	1
From 10,001 to 15,000									
Clonakilty	13	4	2	14	4	3	13	4	3

Plant name and population equivalent	BOD			COD			TSS		
	No. of samples	No. of samples >25 mg/l	No. of samples >50 mg/l	No. of samples	No. of samples >125 mg/l	No. of samples >250 mg/l	No. of samples	No. of samples >35 mg/l	No. of samples >87.5 mg/l
Donegal County Council									
From 500 to 999 P.E.									
Kilmacrennan	10	8	3	5	4	1	10	7	0
Newtowncunningham	12	2	1	5	0	0	12	2	1
From 1,000 to 1,999 P.E.									
Ballyliffen	9	5	3	5	2	0	9	4	3
From 2,000 to 10,000 P.E.									
Ballybofey/ Stranorlar	39	0	0	4	0	0	27	0	0
Milford	9	1	1	4	0	0	9	1	1
Raphoe	11	2	1	5	1	0	11	3	0
From 15,001 to 50,000									
Letterkenny	103	101	98	5	5	4	21	20	11
Dun Laoghaire-Rathdown County Council									
From 2,000 to 10,000 P.E.									
Corke Abbey	15	14	8	33	23	6	34	33	6
Fingal County Council									
From 2,000 to 10,000 P.E.									
Portrane	14	5	4	19	5	5	19	9	6
From 15,001 to 50,000									
Malahide	20	2	0	25	2	0	27	11	3
Swords	40	6	0	57	6	1	57	20	5
Galway County Council									
From 500 to 999 P.E.									
Ballygar	4	4	2	4	2	1	4	3	1
Killimor	4	2	1	3	1	0	4	1	0
Moycullen	2	0	0	2	0	0	2	0	0
From 1,000 to 1,999 P.E.									
Headford	13	7	3	13	3	1	13	6	3
Mountbellew	5	4	1	5	0	0	4	1	0
Oughterard	5	2	0	5	0	0	4	2	0
From 2,000 to 10,000 P.E.									
Athenry	13	5	3	13	4	0	13	6	1
Ballinasloe	11	0	0	11	0	0	11	0	0
Gort	14	5	0	14	1	0	14	4	0
Loughrea	13	0	0	12	0	0	13	0	0
Portumna	12	0	0	11	1	0	12	0	0
From 10,001 to 15,000									
Tuam	11	0	0	11	0	0	11	0	0

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	No. of samples	No. of samples >25 mg/l	No. of samples >50 mg/l	No. of samples	No. of samples >125 mg/l	No. of samples >250 mg/l	No. of samples	No. of samples >35 mg/l	No. of samples >87.5 mg/l
Kerry County Council									
From 2,000 to 10,000 P.E.									
Ballybunion	24	0	0	24	0	0	24	0	0
Cahersiveen	52	0	0	52	0	0	52	0	0
Castleisland	13	1	1	13	0	0	13	0	0
Dingle	11	0	0	11	0	0	11	0	0
Kenmare	41	0	0	40	0	0	40	1	0
Killorglin	44	0	0	40	0	0	45	0	0
From 10,001 to 15,000									
Listowel	46	0	0	47	0	0	47	0	0
From 15,001 to 50,000									
Killarney	50	0	0	50	0	0	51	0	0
Tralee	46	0	0	52	0	0	52	0	0
Kildare County Council									
From 500 to 999 P.E.									
Kilmeague	12	6	3	14	1	1	12	2	2
Nurney	18	0	0	18	0	0	18	2	0
Rathangan	8	1	0	12	0	0	11	1	1
Derrinturn	8	5	2	9	1	1	9	2	2
From 2,000 to 10,000 P.E.									
Kildare Town	27	10	8	27	15	7	27	11	0
From 10,001 to 15,000									
Athy	12	0	0	12	0	0	9	0	0
From 50,001 to 150,000									
Leixlip	26	0	0	30	0	0	31	0	0
Osberstown	291	0	0	350	0	0	352	30	0
Kilkenny County Council									
From 500 to 999 P.E.									
Clogh-Moneenroe	3	1	1	3	1	1	3	1	1
Piltown	5	0	0	5	0	0	5	0	0
Gowran	4	4	4	4	2	4	4	1	4
From 1,000 to 1,999 P.E.									
Castlecomer	6	6	3	6	3	0	6	0	0
From 2,000 to 10,000 P.E.									
Callan	6	2	2	6	1	1	5	2	1
From 50,001 to 150,000									
Kilkenny (Purcellsinch)	191	12	5	191	10	5	174	22	2

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	No. of samples	No. of samples >25 mg/l	No. of samples >50 mg/l	No. of samples	No. of samples >125 mg/l	No. of samples >250 mg/l	No. of samples	No. of samples >35 mg/l	No. of samples >87.5 mg/l
Laois County Council									
From 500 to 999 P.E.									
Ballinakill	5	1	0	5	0	0	5	1	1
Ballylinan	6	3	1	6	2	0	6	4	1
Borris-in-Ossory	5	0	0	4	0	0	6	2	0
Castletown	6	6	0	6	0	0	6	0	0
From 2,000 to 10,000 P.E.									
Rathdowney	6	6	3	5	3	0	7	4	0
Abbeyleix	8	0	0	8	1	0	8	4	3
Mountmellick	8	0	0	8	0	0	8	0	0
Portarlinton	7	0	0	7	0	0	7	1	1
Mountrath	6	3	1	5	0	0	6	5	4
From 15,001 to 50,000									
Portlaoise	3	0	0	4	0	0	4	0	0
Leitrim County Council									
From 1,000 to 1,999 P.E.									
Ballinamore	8	0	0	8	0	0	8	1	0
Drumshanbo	6	1	1	17	1	0	8	0	0
From 2,000 to 10,000 P.E.									
Carrick on Shannon	6	0	0	7	0	0	7	0	0
Manorhamilton	6	0	0	6	0	0	6	1	1
Mohill	5	0	0	7	0	0	7	1	0

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	No. of samples	No. of samples >25 mg/l	No. of samples >50 mg/l	No. of samples	No. of samples >125 mg/l	No. of samples >250 mg/l	No. of samples	No. of samples >35 mg/l	No. of samples >87.5 mg/l
Limerick County Council									
From 500 to 999 P.E.									
Athea	3	3	3	3	3	3	3	3	2
Caherconnish	6	2	0	6	0	0	6	3	0
Cappamore	6	6	4	6	6	2	6	6	1
Doon	3	3	3	3	3	3	3	3	2
Dromcollagher	5	3	1	5	3	0	5	2	1
Kilfinnane	1	1	1	1	0	0	1	0	0
Murroe	3	0	0	3	0	0	3	0	0
Oola	3	1	0	3	0	0	3	2	0
From 1,000 to 1,999 P.E.									
Abbeyfeale	10	1	0	10	0	0	10	0	0
Adare	6	6	6	6	6	6	6	6	6
Askeaton	6	6	6	6	6	4	6	6	2
Bruff	5	3	0	5	3	0	5	4	0
Castleconnell	6	2	1	6	1	0	6	4	0
Croom	6	2	2	6	2	0	6	2	0
Hospital	6	2	2	6	2	0	6	2	2
Patrickswell	6	6	6	5	5	5	6	6	5
From 2,000 to 10,000 P.E.									
Kilmallock	11	5	4	11	4	0	11	6	1
Newcastle West	9	0	0	9	0	0	9	1	0
Rathkeale	11	0	0	12	0	0	12	0	0
From 10,001 to 15,000									
Castletroy	16	0	0	16	0	0	16	0	0
Longford County Council									
From 1,000 to 1,999 P.E.									
Drumlisk	12	11	8	12	5	4	12	11	7
Newtownforbes	11	11	11	11	9	1	11	11	3
From 2,000 to 10,000 P.E.									
Edgeworthstown	12	5	2	12	2	0	12	5	1
Granard	11	2	0	10	0	0	11	4	0
From 15,001 to 50,000									
Longford	12	0	0	11	0	0	12	1	0

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Plant name and population equivalent	BOD			COD			TSS		
	No. of samples	No. of samples >25 mg/l	No. of samples >50 mg/l	No. of samples	No. of samples >125 mg/l	No. of samples >250 mg/l	No. of samples	No. of samples >35 mg/l	No. of samples >87.5 mg/l
Louth County Council									
From 500 to 999 P.E.									
Carlingford	5	1	0	5	0	0	5	1	0
Louth Village	4	0	0	4	0	0	4	0	0
From 1,000 to 1,999 P.E.									
Clogherhead	3	0	0	3	0	0	3	0	0
Dromiskin	4	0	0	4	0	0	4	0	0
Dunleer	6	0	0	6	0	0	6	1	0
From 2,000 to 10,000 P.E.									
Ardee	5	0	0	5	0	0	5	0	0
Blackrock	5	0	0	5	0	0	5	0	0
From 50,001 to 150,000									
Drogheda	4	0	0	4	0	0	3	0	0
150,001 P.E. And Above									
Dundalk	49	2	0	48	0	0	49	0	0
Mayo County Council									
From 500 to 999 P.E.									
Old Head	1	0	0	1	0	0	1	0	0
Shrule	1	0	0	1	0	0	1	0	0
Ballindine	1	1	0	1	0	0	1	1	0
Cong	0	0	0	0	0	0	0	0	0
From 1,000 to 1,999 P.E.									
Bangor Erris	1	0	0	1	0	0	1	0	0
Foxford	1	1	0	1	0	0	1	0	0
From 2,000 to 10,000 P.E.									
Swinford	1	0	0	1	0	0	1	0	0
Ballinrobe	1	0	0	1	0	0	1	0	0
Crossmolina	0	0	0	1	1	0	1	1	0
From 15,001 to 50,000									
Ballina	1	0	0	1	0	0	1	0	0
Castlebar	1	0	0	1	0	0	1	0	0

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	No. of samples	No. of samples >25 mg/l	No. of samples >50 mg/l	No. of samples	No. of samples >125 mg/l	No. of samples >250 mg/l	No. of samples	No. of samples >35 mg/l	No. of samples >87.5 mg/l
Meath County Council									
From 500 to 999 P.E.									
Ballivor	11	8	4	11	6	5	11	9	6
Donore	10	2	0	10	1	0	10	6	4
Drumconrath	6	0	0	9	2	2	9	3	1
Julianstown	4	1	1	4	2	2	4	3	1
Kilmessan	7	0	0	8	0	0	9	3	2
Summerhill	9	2	1	9	2	2	10	6	1
From 1,000 to 1,999 P.E.									
Oldcastle	6	1	0	6	0	0	5	1	1
Slane	7	0	0	6	0	0	8	5	2
From 2,000 to 10,000 P.E.									
Athboy	10	3	0	11	1	1	11	6	0
Duleek	9	0	0	10	1	0	10	4	1
Dunshaughlin	17	6	1	17	4	1	15	6	3
Kells	10	0	0	10	0	0	9	1	0
Laytown	9	0	0	9	1	0	9	2	0
Johnstown Bridge	13	0	0	13	0	0	14	1	0
Stamullen	9	1	0	9	1	1	9	3	1
From 10,001 to 15,000									
Trim	9	0	0	10	0	0	11	1	0
From 15,001 to 50,000									
Navan	10	0	0	11	0	0	11	0	0
Monaghan County Council									
From 500 to 999 P.E.									
Emyvale	5	0	0	5	1	0	5	1	0
Glaslough	6	2	1	6	1	0	6	2	1
Inniskeen	10	2	1	10	1	0	10	1	0
Scotstown	5	0	0	5	0	0	5	1	1
Smithboro	6	0	0	6	0	0	6	0	0
From 1,000 to 1,999 P.E.									
Newbliss	12	10	2	12	4	0	12	8	0
From 2,000 to 10,000 P.E.									
Ballybay	12	0	0	12	0	0	12	0	0
Clones	7	5	1	7	2	0	7	2	0
From 10,001 to 15,000									
Carrickmacross	12	0	0	12	0	0	12	0	0
Castleblaney	12	0	0	12	0	0	12	0	0
From 15,001 to 50,000									
Monaghan	9	0	0	9	0	0	9	0	0

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	No. of samples	No. of samples >25 mg/l	No. of samples >50 mg/l	No. of samples	No. of samples >125 mg/l	No. of samples >250 mg/l	No. of samples	No. of samples >35 mg/l	No. of samples >87.5 mg/l
Offaly County Council									
From 500 to 999 P.E.									
Daingean	8	0	0	8	0	0	8	0	0
From 1,000 to 1,999 P.E.									
Banagher	9	0	0	9	0	0	9	0	0
Kilcormac	8	0	0	8	0	0	8	0	0
From 2,000 to 10,000 P.E.									
Birr	12	0	0	12	0	0	12	0	0
Edenderry	15	6	4	15	4	3	15	7	3
From 10,001 to 15,000									
Tullamore	12	0	0	12	0	0	12	0	0
Roscommon County Council									
From 500 to 999 P.E.									
Elphin	11	1	0	11	1	0	11	2	0
Frenchpark	10	9	5	9	7	2	9	7	2
From 1,000 to 1,999 P.E.									
Strokestown	11	1	0	11	0	0	10	2	2
From 2,000 to 10,000 P.E.									
Ballaghaderreen	11	0	0	11	0	0	11	0	0
Boyle	12	0	0	12	0	0	12	0	0
Castlerea	10	0	0	10	0	0	10	0	0
Monksland	9	0	0	10	0	0	10	1	0
Roscommon	20	0	0	22	0	0	22	0	0
Sligo County Council									
From 500 to 999 P.E.									
Grange	5	2	0	5	0	0	5	1	0
Gurteen	5	3	2	5	2	0	5	2	0
Tubbercurry	7	0	0	7	0	0	7	0	0
Easkey	6	1	0	5	0	0	5	2	0
From 1,000 to 1,999 P.E.									
Strandhill	7	1	0	8	2	0	9	2	1
Enniscrone	9	5	4	10	3	1	7	3	1
Ballymote	6	3	0	7	1	0	7	4	1
From 2,000 to 10,000 P.E.									
Collooney	9	0	0	7	1	0	9	0	0

Plant name and population equivalent	BOD			COD			TSS		
	No. of samples	No. of samples >25 mg/l	No. of samples >50 mg/l	No. of samples	No. of samples >125 mg/l	No. of samples >250 mg/l	No. of samples	No. of samples >35 mg/l	No. of samples >87.5 mg/l
Tipperary North Riding County Council									
From 500 to 999 P.E.									
Borrisokane	6	0	0	6	0	0	6	0	0
Holycross	6	0	0	6	0	0	6	0	0
Littleton	6	0	0	6	0	0	6	0	0
From 1,000 to 1,999 P.E.									
Borrisoleigh	12	1	0	12	1	0	12	2	0
Newport	6	0	0	6	0	0	6	0	0
From 2,000 to 10,000 P.E.									
Ballina	12	0	0	12	0	0	12	0	0
Nenagh Old	13	0	0	13	0	0	13	4	0
From 10,001 to 15,000									
New Nenagh	12	0	0	12	0	0	12	0	0
Roscrea	12	0	0	12	0	0	12	1	0
Thurles	13	0	0	13	0	0	13	1	0
Tipperary South Riding County Council									
From 500 to 999 P.E.									
Killenaule	6	2	1	6	1	1	6	1	1
From 1,000 to 1,999 P.E.									
Fethard	4	1	0	4	0	0	4	1	0
From 2,000 to 10,000 P.E.									
Cahir	6	0	0	6	0	0	6	1	0
Cashel	5	2	0	5	0	0	5	2	1
Tipperary Town	6	2	1	6	0	0	6	3	1
From 15,001 to 50,000									
Clonmel	65	0	0	203	2	0	199	9	0
Waterford County Council									
From 500 to 999 P.E.									
Portlaoigh	4	0	0	4	0	0	4	0	0
From 1,000 to 1,999 P.E.									
Lismore	5	4	0	5	0	0	5	0	0
Westmeath County Council									
From 500 to 999 P.E.									
Clonmellon	5	0	0	1	0	0	5	0	0
Delvin	5	0	0	1	0	0	5	0	0
Tyrellspass	11	1	0	11	0	0	11	2	0
From 1,000 to 1,999 P.E.									
Castlepollard	11	0	0	2	0	0	11	0	0
Rochfortbridge	10	2	0	10	2	1	10	2	1
Kinnegad	7	2	0	1	0	0	7	1	0
From 2,000 to 10,000 P.E.									
Kilbeggan	11	0	0	11	0	0	11	0	0
Moate	13	0	0	14	0	0	14	0	0
From 15,001 to 50,000									
Athlone	15	0	0	15	0	0	13	1	0
Mullingar	15	0	0	11	0	0	15	0	0

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Wexford County Council									
From 500 to 999 P.E.									
Piercetown	2	0	0	2	0	0	2	0	0
From 1,000 to 1,999 P.E.									
Blackwater	3	0	0	3	0	0	3	0	0
Castlebridge	5	0	0	5	0	0	5	1	1
Ferns	5	0	0	5	0	0	5	0	0
From 2,000 to 10,000 P.E.									
Enniscorthy	4	0	0	4	0	0	4	0	0
Gorey	5	0	0	5	0	0	5	0	0
From 10,001 to 15,000									
Kilmuckridge	5	0	0	6	0	0	6	0	0
Wicklow County Council									
From 500 to 999 P.E.									
Dunlavin Milltown	4	4	4	4	4	2	4	4	4
Kilpedder	2	2	2	2	1	0	2	2	2
From 1,000 to 1,999 P.E.									
Ashford	3	1	1	3	0	0	3	1	0
Carnew	4	0	0	4	0	0	4	1	0
Enniskerry	5	0	0	5	0	0	5	0	0
Newcastle	2	1	0	2	1	0	2	1	0
From 2,000 to 10,000 P.E.									
Baltinglass	4	0	0	4	0	0	4	0	0
Kilcoole	3	1	0	3	0	0	3	1	0
Blessington	4	2	0	4	0	0	4	1	0
From 10,001 to 15,000									
Greystones	12	0	0	12	0	0	12	0	0

Appendix E1: Effluent quality from secondary waste water treatment plants in 2003

Plant name and population equivalent	BOD			COD			TSS		
	No. of samples	No. of samples >25 mg/l	No. of samples >50 mg/l	No. of samples	No. of samples >125 mg/l	No. of samples >250 mg/l	No. of samples	No. of samples >35 mg/l	No. of samples >87.5 mg/l
Carlow County Council									
From 500 to 999 P.E.									
Borris	7	0	0	7	0	0	6	0	0
Hacketstown	5	4	4	5	4	3	5	5	3
Rathvilly	5	5	5	5	5	4	5	4	0
From 2,000 to 10,000 P.E.									
Muinebheag	9	0	0	9	0	0	9	0	0
Tullow	8	1	1	8	1	1	8	1	1
From 15,001 to 50,000									
Mortarstown	9	1	0	10	0	0	10	0	0
Cavan County Council									
From 500 to 999 P.E.									
Ballinagh	3	0	0	2	0	0	3	0	0
Blacklion	3	1	1	4	1	0	4	1	0
Killeshandra	2	2	1	2	1	0	2	1	0
Mullagh	1	1	1	1	1	1	1	1	1
From 1,000 to 1,999 P.E.									
Bailieborough	6	0	0	7	0	0	8	0	0
Ballyconnell	1	0	0	1	0	0	2	0	0
Kingscourt	6	1	0	6	0	0	8	1	0
From 2,000 to 10,000 P.E.									
Cootehill	6	0	0	5	0	0	6	0	0
Virginia	1	0	0	0	0	0	1	0	0
Ballyjamesduff	9	0	0	12	0	0	12	0	0
From 15,001 to 50,000									
Cavan	9	2	0	10	0	0	12	0	0
Clare County Council									
From 500 to 999 P.E.									
Inagh	8	0	0	8	0	0	9	2	0
Kilkishen	7	0	0	7	0	0	7	0	0
Kilmihil	11	1	0	12	0	0	12	3	0
Quin	10	0	0	10	0	0	10	1	0
Tulla	6	6	5	6	4	0	6	5	2
From 1,000 to 1,999 P.E.									
Milltown/ Malbay	10	7	5	12	6	0	12	7	2
Sixmilebridge	10	0	0	10	0	0	10	0	0
From 2,000 to 10,000 P.E.									
Clare Abbey	12	1	0	12	0	0	12	1	0
Ennistymon	8	6	3	10	4	0	9	6	0
Lahinch	8	0	0	10	0	0	9	1	1
Lisdoonvarna	9	0	0	10	0	0	9	0	0
Newmarket-on-Fergus	10	0	0	10	0	0	10	2	0
From 10,001 to 15,000									
Tradaree	12	12	12	12	11	7	12	11	3
From 15,001 to 50,000									
Clonroadmore	12	1	0	12	0	0	12	0	0

Plant name and population equivalent	BOD			COD			TSS		
	No. of samples	No. of samples >25 mg/l	No. of samples >50 mg/l	No. of samples	No. of samples >125 mg/l	No. of samples >250 mg/l	No. of samples	No. of samples >35 mg/l	No. of samples >87.5 mg/l
Cork County Council West									
From 1,000 to 1,999 P.E.									
Dunmanway	2	2	1	2	1	1	2	1	
From 10,001 to 15,000									
Clonakilty	9	0	0	10	0	0	10	0	
Cork County Council North									
From 500 to 999 P.E.									
Boherbue	2	1	1	2	0	0	2	0	0
Kildorrery	3	0	0	3	0	0	2	0	0
Rathcormac	4	4	3	4	4	2	3	3	1
From 1,000 to 1,999 P.E.									
Buttevant	5	5	4	5	5	3	5	4	1
Doneraile	3	3	2	3	2	2	3	3	2
Kanturk	3	0	0	4	0	0	4	1	0
Millstreet	1	0	0	1	0	0	1	0	0
Newmarket	4	1	0	4	0	0	4	0	0
Watergrasshill	3	2	0	3	0	0	3	1	0
From 2,000 to 10,000 P.E.									
Charleville	2	0	0	2	0	0	2	0	0
Mitchelstown	5	0	0	5	0	0	5	1	0
From 10,001 to 15,000									
Fermoy	10	0	0	12	0	0	12	0	0
Mallow	13	0	0	13	0	0	13	0	0
Cork County Council South									
From 500 to 999 P.E.									
Cloughroe	4	2	2	4	2	1	4	2	2
Cloyne	3	0	0	3	0	0	2	0	0
Dripsey	2	0	0	2	0	0	2	0	0
Killeagh	3	1	1	3	1	1	3	1	0
From 2,000 to 10,000 P.E.									
Bandon	10	0	0	11	0	0	10	0	0
Blarney/ Tower	7	1	1	7	2	1	7	2	1
Carrigtohill	11	1	0	12	1	0	12	2	1
Castlemartyr	3	0	0	3	0	0	3	1	0
Macroom U.D.C.	3	0	0	3	0	0	2	1	0
Midleton	12	0	0	12	0	0	12	0	0
From 10,001 to 15,000									
Ballincollig New	11	1	0	12	0	0	12	2	0

Plant name and population equivalent	BOD			COD			TSS		
	No. of samples	No. of samples >25 mg/l	No. of samples >50 mg/l	No. of samples	No. of samples >125 mg/l	No. of samples >250 mg/l	No. of samples	No. of samples >35 mg/l	No. of samples >87.5 mg/l
Donegal County Council									
From 500 to 999 P.E.									
Kilmacrennan	10	8	6	10	8	3	10	7	1
From 1,000 to 1,999 P.E.									
Ballyliffen	11	9	3	8	7	4	11	10	4
Newtowncunningham	12	8	6	10	5	3	12	7	6
From 2,000 to 10,000 P.E.									
Ballybofey/ Stranorlar	13	0	0	11	0	0	13	0	0
Carndonagh	14	0	0	10	0	0	14	0	0
Donegal Town	16	10	9	16	10	6	16	12	8
Milford	10	0	0	10	2	0	10	0	0
Raphoe	11	3	1	11	2	0	11	4	0
From 15,001 to 50,000									
Letterkenny	12	12	11	10	10	9	9	8	4
Dublin Corporation									
150,001 P.E. And Above									
Ringsend	102	34	13	230	39	10	230	134	39
Dun Laoghaire-Rathdown County Council									
From 2,000 to 10,000 P.E.									
Corke Abbey	15	14	8	22	21	12	22	22	12
Fingal County Council									
From 2,000 to 10,000 P.E.									
Portrane	18	2	1	26	2	1	26	8	3
From 15,001 to 50,000									
Swords	42	1	0	48	1	0	48	4	0
Malahide	39	1	0	46	1	0	47	19	2
Galway County Council									
From 500 to 999 P.E.									
Ballygar	2	2	2	2	2	1	2	2	1
Mountbellew	3	3	1	4	1	0	4	3	1
Oughterard	3	2	1	4	0	0	4	2	0
From 1,000 to 1,999 P.E.									
Killimor	4	3	2	4	2	0	4	2	1
From 2,000 to 10,000 P.E.									
Athenry	12	5	2	13	2	0	12	4	1
Ballinasloe	8	0	0	9	0	0	9	0	0
Gort	12	5	0	12	2	0	12	6	0
Loughrea	11	1	0	12	0	0	12	0	0
Headford	12	5	1	12	2	0	12	4	0
Moycullen	15	0	0	15	0	0	15	0	0
From 15,001 to 50,000									
Tuam	12	0	0	12	0	0	12	0	0

Plant name and population equivalent	BOD			COD			TSS		
	No. of samples	No. of samples >25 mg/l	No. of samples >50 mg/l	No. of samples	No. of samples >125 mg/l	No. of samples >250 mg/l	No. of samples	No. of samples >35 mg/l	No. of samples >87.5 mg/l
Kerry County Council									
From 2,000 to 10,000 P.E.									
Ballybunion	24	0	0	24	0	0	24	0	0
Ballyheigue	14	0	0	14	0	0	12	0	0
Cahersiveen	51	0	0	51	0	0	51	0	0
Castleisland	22	0	0	22	0	0	20	1	0
Dingle	12	0	0	12	0	0	12	0	0
Kenmare	12	3	2	12	2	1	12	4	4
Killorglin	45	0	0	42	0	0	45	0	0
Listowel	42	0	0	43	1	1	43	0	0
From 15,001 to 50,000									
Killarney	50	0	0	50	0	0	50	0	0
Tralee	44	0	0	45	0	0	44	0	0
Kildare County Council									
From 500 to 999 P.E.									
Derrinturn	8	0	0	9	0	0	9	0	0
Kilmeague	5	0	0	5	0	0	5	0	0
From 2,000 to 10,000 P.E.									
Kildare Town	30	6	0	30	14	0	30	13	0
Rathangan	8	0	0	9	0	0	9	0	0
From 10,001 to 15,000									
Athy	10	0	0	12	0	0	2	0	0
From 50,001 to 150,000									
Leixlip	47	0	0	48	0	0	47	0	0
Osberstown	285	0	0	332	1	0	331	5	0
Kilkenny County Council									
From 500 to 999 P.E.									
Clogh-Moneenroe	2	1	0	2	0	0	0	0	0
Gowran	5	5	5	5	5	3	0	0	0
Piltown	4	2	0	4	0	0	0	0	0
From 1,000 to 1,999 P.E.									
Castlecomer	5	2	2	5	0	0	0	0	0
From 2,000 to 10,000 P.E.									
Callan	4	2	2	3	2	0	0	0	0
From 50,001 to 150,000									
Kilkenny (Purcellsinch)	206	26	21	206	19	15	0	0	0

Plant name and population equivalent	BOD			COD			TSS		
	No. of samples	No. of samples >25 mg/l	No. of samples >50 mg/l	No. of samples	No. of samples >125 mg/l	No. of samples >250 mg/l	No. of samples	No. of samples >35 mg/l	No. of samples >87.5 mg/l
Laois County Council									
From 500 to 999 P.E.									
Ballinakill	3	0	0	4	0	0	5	2	1
Borris-in-Ossory	7	0	0	7	0	0	6	1	0
From 1,000 to 1,999 P.E.									
Mountrath	9	2	1	9	2	1	8	7	2
Rathdowney	6	3	1	5	2	0	6	4	1
Abbeyleix	7	0	0	7	0	0	8	4	0
From 2,000 to 10,000 P.E.									
Mountmellick	9	0	0	9	0	0	9	0	0
Portarlinton	9	0	0	9	0	0	9	0	0
From 15,001 to 50,000									
Portlaoise	14	2	0	14	2	1	14	4	0
Leitrim County Council									
From 500 to 999 P.E.									
Carrigallen	4	1	1	4	1	1	4	1	1
Dromahair	6	0	0	6	1	1	6	1	1
Drumshanbo	7	1	0	6	0	0	7	0	0
Leitrim Village	4	0	0	3	0	0	4	0	0
Kinlough	7	1	1	7	1	1	7	1	1
From 1,000 to 1,999 P.E.									
Ballinamore	8	0	0	8	0	0	8	0	0
Manorhamilton	11	0	0	11	0	0	11	0	0
Mohill	10	0	0	10	0	0	10	0	0
From 2,000 to 10,000 P.E.									
Carrick on Shannon	12	4	1	12	3	0	12	3	0

Plant name and population equivalent	BOD			COD			TSS		
	No. of samples	No. of samples >25 mg/l	No. of samples >50 mg/l	No. of samples	No. of samples >125 mg/l	No. of samples >250 mg/l	No. of samples	No. of samples >35 mg/l	No. of samples >87.5 mg/l
Limerick County Council									
From 500 to 999 P.E.									
Athea	4	4	4	4	4	4	4	4	4
Cahercornlish	6	2	2	6	2	0	6	4	1
Cappamore	6	5	3	7	5	2	7	5	2
Doon	3	2	1	3	3	1	3	3	2
Dromcollagher	6	6	4	6	4	2	5	3	0
Murroe	4	1	1	4	1	1	4	3	1
Oola	4	2	1	5	2	0	5	2	1
From 1,000 to 1,999 P.E.									
Abbeyfeale	12	0	0	14	0	0	14	1	0
Adare	6	6	6	6	6	6	6	5	5
Askeaton	8	8	8	8	8	7	8	8	7
Bruff	6	5	1	6	3	1	6	4	1
Castleconnell	3	3	0	4	3	0	4	4	0
Croom	6	2	2	7	2	0	7	2	1
Hospital	7	7	4	8	6	2	8	4	2
Patrickswell	5	5	5	5	5	5	5	5	4
From 2,000 to 10,000 P.E.									
Kilmallock	14	6	5	14	2	0	13	4	2
Newcastle West	11	0	0	16	1	0	16	0	0
Rathkeale	12	2	1	13	0	0	12	4	1
From 10,001 to 15,000									
Castletroy	24	0	0	24	0	0	24	0	0
Longford County Council									
From 1,000 to 1,999 P.E.									
Newtownforbes	11	11	11	11	11	6	11	11	7
From 2,000 to 10,000 P.E.									
Ballymahon	11	0	0	11	0	0	11	0	0
Edgeworthstown	11	4	2	11	3	1	11	4	2
Granard	11	0	0	11	0	0	11	3	0
From 15,001 to 50,000									
Longford	11	0	0	11	0	0	11	0	0

Plant name and population equivalent	BOD			COD			TSS		
	No. of samples	No. of samples >25 mg/l	No. of samples >50 mg/l	No. of samples	No. of samples >125 mg/l	No. of samples >250 mg/l	No. of samples	No. of samples >35 mg/l	No. of samples >87.5 mg/l
Louth County Council									
From 500 to 999 P.E.									
Carlingford	7	1	1	6	1	1	7	2	1
Louth Village	4	0	0	4	0	0	4	0	0
Tullyallen	4	4	4	4	4	1	4	2	1
From 1,000 to 1,999 P.E.									
Castlebellingham	5	0	0	5	0	0	5	0	0
Clogherhead	1	0	0	1	0	0	1	0	0
Dromiskin	4	2	1	4	1	1	4	1	0
Dunleer	8	0	0	8	0	0	8	1	0
From 2,000 to 10,000 P.E.									
Ardee	8	4	1	8	1	0	8	1	1
Blackrock	7	0	0	7	1	0	7	1	0
From 50,001 to 150,000									
Drogheda	40	1	1	39	0	0	40	0	0
150,001 P.E. And Above									
Dundalk	51	0	0	364	2	1	51	0	0
Mayo County Council									
From 500 to 999 P.E.									
Ballindine	1	0	0	2	0	0	2	1	0
Belcarra	0	0	0	1	1	0	1	1	0
Kilkelly	0	0	0	1	0	0	1	0	0
Old Head	1	0	0	1	0	0	1	0	0
Shrule	1	0	0	1	0	0	1	0	0
Knock	0	0	0	1	0	0	1	0	0
From 1,000 to 1,999 P.E.									
Bangor Erris	0	0	0	2	0	0	2	0	0
Charlestown	1	0	0	2	0	0	2	0	0
Cong	0	0	0	0	0	0	0	0	0
Foxford	1	1	0	1	1	1	1	1	1
Crossmolina	1	1	1	1	1	1	1	1	1
From 2,000 to 10,000 P.E.									
Ballinrobe	1	0	0	1	0	0	1	0	0
Ballyhaunis	1	0	0	1	0	0	1	0	0
Swinford	3	0	0	3	0	0	3	0	0
From 15,001 to 50,000									
Ballina	2	0	0	2	0	0	2	0	0
Castlebar	1	0	0	1	0	0	1	0	0

Plant name and population equivalent	BOD			COD			TSS		
	No. of samples	No. of samples >25 mg/l	No. of samples >50 mg/l	No. of samples	No. of samples >125 mg/l	No. of samples >250 mg/l	No. of samples	No. of samples >35 mg/l	No. of samples >87.5 mg/l
Meath County Council									
From 500 to 999 P.E.									
Ballivor	12	3	2	12	2	1	12	4	1
Drumconrath	5	0	0	6	1	0	6	0	0
Julianstown	3	0	0	2	0	0	3	0	0
Kilmessan	11	1	1	11	1	1	11	4	1
Longwood	10	1	1	10	2	1	10	3	1
Summerhill	11	4	1	11	1	0	11	4	1
From 1,000 to 1,999 P.E.									
Oldcastle	9	0	0	9	0	0	9	1	0
Slane	7	0	0	8	0	0	8	1	0
From 2,000 to 10,000 P.E.									
Athboy	5	2	1	5	4	0	5	4	1
Duleek	12	1	0	12	1	1	12	0	0
Dunshaughlin	18	0	0	20	2	1	20	3	0
Kells	10	0	0	10	0	0	10	1	0
Laytown	11	2	1	9	1	1	11	1	1
Johnstown Bridge	7	0	0	7	0	0	7	0	0
Stamullen	11	1	0	11	1	0	11	3	1
From 10,001 to 15,000									
Trim	11	0	0	11	0	0	11	0	0
From 15,001 to 50,000									
Navan	12	0	0	12	0	0	12	0	0
Monaghan County Council									
From 500 to 999 P.E.									
Emyvale	11	6	3	11	2	0	11	1	0
Glaslough	12	2	2	12	1	1	12	1	1
Inniskeen	5	0	0	5	0	0	5	0	0
Scotstown	7	1	0	8	0	0	7	0	0
Smithboro	12	0	0	12	0	0	12	0	0
From 1,000 to 1,999 P.E.									
Newbliss	12	10	4	12	6	0	12	5	1
From 2,000 to 10,000 P.E.									
Ballybay	11	0	0	12	0	0	12	0	0
Clones	12	2	2	12	1	0	12	1	0
From 10,001 to 15,000									
Carrickmacross	12	0	0	12	0	0	12	0	0
Castleblayney	12	0	0	12	0	0	12	0	0
From 15,001 to 50,000									
Monaghan	12	0	0	12	0	0	11	0	0

Plant name and population equivalent	BOD			COD			TSS		
	No. of samples	No. of samples >25 mg/l	No. of samples >50 mg/l	No. of samples	No. of samples >125 mg/l	No. of samples >250 mg/l	No. of samples	No. of samples >35 mg/l	No. of samples >87.5 mg/l
Offaly County Council									
From 500 to 999 P.E.									
Cloghan	8	0	0	8	0	0	8	0	0
Daingean	11	1	0	11	0	0	11	1	0
From 1,000 to 1,999 P.E.									
Banagher	11	0	0	11	0	0	11	0	0
Kilcormac	6	0	0	6	0	0	6	0	0
From 2,000 to 10,000 P.E.									
Birr	12	0	0	12	0	0	12	0	0
Edenderry	20	1	0	20	0	0	20	1	0
From 10,001 to 15,000									
Tullamore	12	0	0	12	0	0	12	0	0
Roscommon County									
From 500 to 999 P.E.									
Elphin	11	1	0	11	0	0	11	2	0
Frenchpark	12	12	11	12	12	7	12	12	5
Hodson Bay	9	0	0	9	1	0	9	3	1
Knockcroghery	9	0	0	9	0	0	9	1	0
From 1,000 to 1,999 P.E.									
Strokestown	11	0	0	11	0	0	11	0	0
From 2,000 to 10,000 P.E.									
Castlerea	11	0	0	11	0	0	11	0	0
Boyle	12	1	0	12	2	0	13	3	2
Monksland	12	1	1	12	1	1	12	1	0
From 10,001 to 15,000									
Roscommon	12	0	0	12	0	0	12	0	0
Sligo County Council									
From 500 to 999 P.E.									
Easkey	5	0	0	5	0	0	4	0	0
Grange	2	1	0	5	1	0	5	4	0
Gurteen	4	2	1	4	1	0	4	1	0
Collooney	6	0	0	6	0	0	7	0	0
From 1,000 to 1,999 P.E.									
Strandhill	8	5	3	8	3	1	8	3	1
From 2,000 to 10,000 P.E.									
Enniscrone	8	4	3	10	4	3	10	3	2
Tubbercurry	9	2	0	8	1	0	9	2	0

Plant name and population equivalent	BOD			COD			TSS		
	No. of samples	No. of samples >25 mg/l	No. of samples >50 mg/l	No. of samples	No. of samples >125 mg/l	No. of samples >250 mg/l	No. of samples	No. of samples >35 mg/l	No. of samples >87.5 mg/l
Tipperary North Riding County Council									
From 500 to 999 P.E.									
Borrisokane	6	1	1	6	0	0	6	1	0
Old Nenagh	12	0	0	12	0	0	12	3	0
Holycross	7	0	0	7	0	0	7	1	0
Littleton	7	0	0	7	0	0	7	0	0
Newport	6	0	0	6	0	0	6	0	0
From 1,000 to 1,999 P.E.									
Borrisoleigh	12	0	0	12	1	0	12	2	0
From 2,000 to 10,000 P.E.									
Ballina	13	0	0	12	0	0	13	0	0
From 10,001 to 15,000									
New Nenagh	12	0	0	12	0	0	12	0	0
Roscrea	12	0	0	12	0	0	12	2	0
Thurles	12	0	0	12	0	0	12	1	0
Tipperary South Riding County Council									
From 500 to 999 P.E.									
Killenaule	4	1	1	4	1	0	4	2	0
From 1,000 to 1,999 P.E.									
Fethard	7	2	1	7	1	0	7	1	0
From 2,000 to 10,000 P.E.									
Cahir	7	0	0	7	0	0	7	0	0
Cashel	8	2	0	8	1	0	8	2	0
Tipperary	8	0	0	8	0	0	8	0	0
From 15,001 to 50,000									
Clonmel	81	0	0	81	0	0	81	4	0

Plant name and population equivalent	BOD			COD			TSS		
	No. of samples	No. of samples >25 mg/l	No. of samples >50 mg/l	No. of samples	No. of samples >125 mg/l	No. of samples >250 mg/l	No. of samples	No. of samples >35 mg/l	No. of samples >87.5 mg/l
Waterford County Council									
From 1,000 to 1,999 P.E.									
Lismore	3	0	0	3	0	0	3	2	0
Portlaw	3	0	0	3	0	0	3	0	0
Westmeath County Council									
From 500 to 999 P.E.									
Ballynacarrigy	12	0	0	0	0	0	12	0	0
Clonmellon	12	3	0	0	0	0	12	0	0
Delvin	13	0	0	0	0	0	13	0	0
Killucan	12	4	1	0	0	0	12	4	0
Tyrellspass	10	0	0	10	0	0	10	0	0
From 1,000 to 1,999 P.E.									
Castlepollard	11	0	0	0	0	0	10	0	0
From 2,000 to 10,000 P.E.									
Killbeggan	11	0	0	11	0	0	11	0	0
Kinnegad	11	0	0	0	0	0	11	0	0
Moate	12	0	0	12	0	0	12	0	0
Rochfortbridge	9	2	1	9	1	0	9	3	0
From 15,001 to 50,000									
Athlone	19	0	0	19	0	0	18	0	0
Mullingar	15	0	0	10	0	0	14	0	0

Plant name and population equivalent	BOD			COD			TSS		
	No. of samples	No. of samples >25 mg/l	No. of samples >50 mg/l	No. of samples	No. of samples >125 mg/l	No. of samples >250 mg/l	No. of samples	No. of samples >35 mg/l	No. of samples >87.5 mg/l
Wexford County Council									
From 500 to 999 P.E.									
Bridgetown	2	0	0	2	0	0	2	0	0
Piercetown	2	1	0	2	1	0	2	1	0
Taghmon	2	2	1	2	1	0	2	2	0
From 1,000 to 1,999 P.E.									
Blackwater	2	0	0	2	0	0	2	0	0
Castlebridge	2	0	0	2	0	0	2	0	0
Clonroche	2	1	0	2	1	0	2	1	0
Ferns	2	0	0	2	0	0	2	0	0
Kilmuckridge	2	0	0	2	0	0	2	0	0
From 2,000 to 10,000 P.E.									
Courtown/ Riverchapel	3	0	0	3	0	0	3	0	0
Enniscorthy	2	0	0	2	0	0	2	0	0
Gorey	2	0	0	2	0	0	2	0	0
Rosslare Strand	2	1	0	2	0	0	2	1	0
Wicklow County Council									
From 500 to 999 P.E.									
Dunlavin Milltown	5	5	5	5	5	1	5	5	5
Kilpedder	4	4	3	4	4	2	4	4	3
From 1,000 to 1,999 P.E.									
Blessington	6	4	1	6	3	0	6	4	0
Carnew	3	0	0	3	0	0	3	0	0
Enniskerry	5	0	0	4	0	0	5	0	0
Newcastle	4	2	1	4	2	0	4	2	0
From 2,000 to 10,000 P.E.									
Baltinglass	4	0	0	4	0	0	4	0	0
Kilcoole	4	0	0	4	1	0	4	0	0
From 10,001 to 15,000									
Greystones	11	1	0	11	0	0	11	1	0

Appendix F1: Sludge Generated at Waste Water Treatment Plants 2002 and 2003

<i>Local Authority</i>	<i>2002</i>	<i>2003</i>
	<i>tds/year</i>	<i>tds/year</i>
<i>Carlow County Council</i>	<i>546</i>	<i>546</i>
<i>Cavan County Council</i>	<i>314</i>	<i>250</i>
<i>Clare County Council</i>	<i>500</i>	<i>333</i>
<i>Cork County North</i>	<i>814</i>	<i>559</i>
<i>Cork County South</i>	<i>681</i>	<i>927</i>
<i>Cork County West</i>	<i>184</i>	<i>170</i>
<i>Donegal County Council</i>	<i>759</i>	<i>707</i>
<i>Dublin Corporation</i>	<i>6750</i>	<i>11705</i>
<i>Fingal County Council</i>	<i>1326</i>	<i>6700</i>
<i>Dun Laoghaire-Rathdown County Council</i>	<i>31</i>	<i>31</i>
<i>Galway County Council</i>	<i>1315</i>	<i>994</i>
<i>Kerry County Council</i>	<i>872</i>	<i>933</i>
<i>Kildare County Council</i>	<i>2364</i>	<i>2605</i>
<i>Kilkenny County Council</i>	<i>2313</i>	<i>2313</i>
<i>Laois County Council</i>	<i>709</i>	<i>974</i>
<i>Leitrim County Council</i>	<i>135</i>	<i>134</i>
<i>Limerick County Council</i>	<i>642</i>	<i>659</i>
<i>Longford County Council</i>	<i>750</i>	<i>597</i>
<i>Louth County Council</i>	<i>1108</i>	<i>2563</i>
<i>Mayo County Council</i>	<i>1300</i>	<i>700</i>
<i>Meath County Council</i>	<i>1250</i>	<i>1250</i>
<i>Monaghan County Council</i>	<i>1007</i>	<i>901</i>
<i>Offaly County Council</i>	<i>1702</i>	<i>941</i>
<i>Roscommon County Council</i>	<i>617</i>	<i>392</i>
<i>Sligo County Council</i>	<i>169</i>	<i>16</i>
<i>Tipperary N.R. Co. Co.</i>	<i>1205</i>	<i>1170</i>
<i>Tipperary S.R. Co. Co.</i>	<i>2168</i>	<i>513</i>
<i>Waterford County Council</i>	<i>25</i>	<i>8</i>
<i>Westmeath County Council</i>	<i>1245</i>	<i>1213</i>
<i>Wexford County Council</i>	<i>774</i>	<i>815</i>
<i>Wicklow County Council</i>	<i>212</i>	<i>680</i>
<i>Total</i>	<i>33,786</i>	<i>42,298</i>

USER COMMENT FORM

NOTE: Completed comments to be forwarded to: The Office of Environmental Enforcement,
Environmental Protection Agency, P.O. Box 3000, Johnstown Castle Estate, Wexford.

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