

DISCHARGE CONSENTS

MONITORING, COMPLIANCE AND POLLUTION LOAD

1995

Environment Agency

SUMMARY

The Environment Agency is a public body whose job is to protect the Environment. One of our aims is to improve the quality of waters by controlling the risk of pollution.

We set the standards, or Consents, that are required for discharges of wastewater. We can prosecute dischargers who fail to meet these standards.

We report here on our monitoring of discharges and we summarise the performance of discharges. We give details for different parts of England and Wales.

Thirty percent of Consented Discharges are important enough to require Numeric Conditions on the amount of pollution in the effluent. Most of these discharges are made either by the Water Companies or by Industry.

Seventy percent of Consented Discharges are controlled by Descriptive Conditions. These may state the type of equipment which must be deployed to control the quality of the discharge, and may specify the impacts on the Environment that must be prevented.

Discharges from sewage treatment works operated by the Water Companies have continued to improve:

- The load of BOD discharged to rivers has reduced by 25 %. The load of Ammonia dropped by 36 %.
- Over 4200 have Consents with Numeric Standards. We took samples of 94 % of these and 97 % of the sampled discharges complied with all the conditions in their Consents. The compliance was 96 % in 1994 and 94 % in 1993.
- About 1800 are small enough to warrant Descriptive Conditions. We inspected 86 % of these and 91 % of the inspected discharges complied. Last year these figures were 90 and 87 %, respectively.

There has been little change for discharges made by Industry:

- About 5000 have Consents with Numeric Standards, and are classified as Significant Discharges because of their size. We took samples of 71 % of these and 71 % of the sampled discharges complied with their Consents. Last year these figures were 71 and 69 %, respectively.

We explain why the number of prosecutions will always be a small proportion of the number of discharges reported, from our routine monitoring, to have failed their Consents. In a typical year we take about 60 prosecutions for violations of Consents.



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1 INTRODUCTION

We are a public body whose job is to protect the Environment. We operate through eight Regions (covering 26 Areas) in England and Wales and aim to protect and improve the quality of air, land and water by controlling the risk of pollution. (The Agency also has duties for water resources, flood defence, freshwater fisheries, conservation and navigation).

We monitor the environment, undertake research, and advise how this country should allow development that is safe, sustainable and protects options for our grandchildren. We advise on all types of development that may affect the environment - the location of new factories, for example. And the action we propose must impose no excessive costs on society.

Many of our successes are the result of campaigns or visits and co-operative ventures with others. We seek to reduce waste through recycling. Some improvements follow only from the use of our powers to prosecute polluters.

Our work is strongly affected by the Directives issued by the European Union. We have to monitor, report, and pursue improvements.

We have to choose whether to direct waste to air, land or water. In doing this we aim for controls that give the best overall outcome. This approach is called *Integrated Pollution Control*. It requires that we work closely with industry to minimise pollution at source. If you operate a Prescribed Process you need an Authorisation from us. You will have to control your process using the *Best Available Techniques Not Entailing Excessive Cost*.

We also license the disposal of solid waste and establish strategic plans for this. You also need a license from the Agency to abstract from inland waters. We decide where and when water can be taken for agriculture, industry or for Public Water Supply.

If you discharge waste water to the sea or inland you require a Consent from the Agency (unless you are covered by Integrated Pollution Control). In setting your Consent we aim to achieve local and European targets for water quality, subject, as in all our work, to our duty to have regard to costs and benefits. We have powers to prosecute dischargers who operate outside their Consent. (And we always seek to prosecute for incidents that cause serious damage to waters, abstractors or wildlife).

Information on our activities is held on our Public Registers. We aim to inform through debate, and by providing good information. You can influence our plans by contributing to our Local Environment Agency Plans (called LEAPS, for short). And you can contact us for further information at our offices at Region and Area.

2 CONSENTS

A Consent is a legal document that sanctions the discharge of effluent to water. It states the amount of wastewater that can be discharged, and may set limits on the composition of the wastewater.

There are over 95,000 discharges that have Consents. This total covers a great variety of effluents and dischargers. This report gives the numbers of discharges of various types, and discusses how the discharges are monitored. It also describes the performance of discharges against their Consents.

We face a dilemma because to make fair comparisons of performance, we ought to apply similar monitoring to all discharges. On the other hand, the practical implementation of our duty to monitor pollution means that we concentrate our effort on those discharges that could pose the biggest threats. This can produce a different emphasis across England and Wales, and can result in misleading comparisons.

Similarly, to compare types of discharger, we should apply similar Consents to all discharges and use the same definition of compliance. But we have to face the fact that different types of discharge have different standards applied, and these may be subject to different legal definitions of compliance. This too can produce misleading comparisons.

Over the years, the Agency and its predecessors have seen waves of complex changes in the ways Consents are set and used. The legacy of these is still with us. Some features of Consents may seem more strict in certain parts of England and Wales. This may reflect past levels of investment, or differences in past Environmental needs.

Most discharges are small and innocuous. These need not be monitored directly because they have very little potential to cause pollution. The impact of groups of these small discharges is assessed by checking the quality of the receiving waters. When we detect pollution, we start to monitor the potential culprits in order to find the cause of the pollution, and to decide the action.

Most of our monitoring is directed at discharges that have the greatest potential for impact. In the main, these discharges are made by the Water Companies, or by Industry.

In 1993, we adopted new ways of reporting and classifying discharges. Our aim is to try to deal with the legacy of the enormous diversity of historic practice, and so generate summary statistics that are more useful. This report is the third to follow the new approach. (Our report, *Discharge Consents and Compliance* (Water Quality Series No. 17), provided a review for the years from 1990 to 1992, and two internal reports, *Discharge Consents: Monitoring and Compliance in 1993*, and a subsequent volume for 1994 are available).

In order to set down facts that can be properly used in the future, we must make occasional use of technical terms. We have provided a Glossary of these. Terms defined in the Glossary are indicated in the main text and in the Tables by capital letters as in: Descriptive Consent, Combined Sewer Overflow, or Process Effluent.

3 TYPES OF DISCHARGES

Consents cannot be applied to all discharges. Discharges from abandoned mines, for instance, may cause pollution, but they are outside the scope of our powers to control by Consent.

As noted in Section 1, discharges to water from processes covered by Integrated Pollution Control are covered by an Authorisation. These discharges are not covered in this report.

This report deals only with discharges from fixed points, such as the end of a pipe. These discharges are called Point Source Discharges. It is only these discharges that can be controlled by Consent. In this report, the term, *Discharge*, means *Point Source Discharge*.

We differentiate between the Discharges operated by the Water Companies¹ and those operated by all other bodies. This is because these groups have different types of standards in their Consents. For example, most standards for discharges from sewage treatment works owned by the Water Companies are 95-percentiles (standards that must be met for 95 % of the time), whereas in other discharges, the 95-percentile is hardly ever used.

Discharges made by Industry, Trades and Commerce are given the collective name, Trade Discharges. Many of the most important discharges are covered by Authorisations issued under by the Agency under Integrated Pollution Control. Whilst some trade effluents are discharged to sewer (and their control is therefore the responsibility of a Water Company), the Agency sets Consents only for Trade Discharges where such discharges are made directly to receiving waters (including, of course, discharges made by Water Companies from sewers and sewage treatment works).

¹ By this we mean the ten private Water Services Public limited companies set up in 1989.

In this report, all references to Trade Discharges, cover only those discharges with Consents that enter a water directly.

Definitions of types of discharge within the broad categories discussed above are given in the Glossary. The numbers of discharges within such sub-divisions are given in Tables.

4 TYPES OF CONSENTS

Over 95,000 discharges have consents. The approximate number of consents which have been granted for particular types of discharge is set out in Table 1.

Table 1: Number of Consents in England and Wales	
Type of Discharge	Number
Sewage	77000
Water Companies:	
Sewage Treatment Works	6000
Intermittent discharges	24000
Other Dischargers:	
Sewage Treatment Works	47000
Intermittent discharges	300
Trade	12000
Other Discharges	6000
Total	95000

Consents fall into one of three types: Numeric, Non-numeric and Descriptive. As indicated above, Discharges that have the biggest potential to affect the environment have Numeric Consents.

Non-numeric Consents are used where the controls required of the Discharge are not easily or usefully defined by a numerical standard on effluent quality. Such Consents are usually set for overflows to waters from sewers that also receive the rainfall that runs off from land (Combined Sewer Overflows). The Consent will set the conditions under which a discharge to water is permitted.

As indicated above, Descriptive Consents are normally restricted to small discharges. Descriptive Conditions may also be included within Numeric Consents. For example, a Numeric Consent may include a clause stating that the discharge must not harm fish.

5 CONSENTED DISCHARGES AND MONITORING

The frequency of sampling of a discharge reflects its potential impact for which the volume of the discharge is used as a broad proxy. For sewage treatment works this is expressed in terms of the population which can be said to be served by the works; for other discharges it is expressed in terms of volume per day. Table 2 provides an overview of sampling arrangements. All the results of monitoring of discharges and receiving waters are held on Public Registers which are available for inspection at our Regional Offices.

Significant Discharges

For operational purposes, we have defined a category of Significant Discharges which comprises about 14,000 point source discharges. These will generally discharge a volume greater than 5m³ per day (although in some cases, whilst the volume of the discharge may be smaller, its type and location may have been sufficiently important to justify inclusion in this category). About 3,000 Significant discharges fall into this latter category. All Significant Discharges are sampled directly.

Whilst all Significant Discharges have numeric consents, many other discharges with numeric consents are not generally sampled directly even though the likely content of the waste water discharged has been determined. Instead the quality of the receiving waters is monitored.

The sampling rate may be larger than indicated in Table 2 where we believe the receiving water is particularly sensitive to a discharge or how that discharge is managed. For example, the Significant Discharges include about 3000 discharges whose size is less than the cut-off point of 5 cubic metres per day given in Table 2.

Numeric Consents

Numeric Consents applied to about 28,000 discharges (out of the total of Consented Discharges of 95,000) of which about 13,000 are Significant Discharges.

Of the Significant Discharges, we sampled 93.8% of the 4267 sewage treatment works operated by water companies, 76% of the 3162 other sewage works and 66% of the 5349 Trade Discharges.

Table 2: Frequency of Sampling		
Sewage Treatment Works with Numeric Consent (Equivalent Population)	Other Discharges Consented Flow (cubic metres per day)	Number of Samples per Year
less than 20	less than 5	none
20 to 250	5 to 100	4
250 to 20000	100 to 10000	12
20000 to 100000	10000 to 50000	24
more than 100000	more than 50000	48

Non-numeric and Descriptive Consents

A Discharge that has a Descriptive Consent is inspected at a frequency commensurate with its potential to affect the environment. As a rule this is, at most, quarterly. We rely on the biological monitoring of receiving waters to support the inspections of the Discharges, and to point to any Discharges which need to be inspected more often.

About 71% of Consented Discharges have Non-numeric or Descriptive Consents. Of these, about half are sewage works not operated by the Water Companies. There were 1808 Discharges with Descriptive Consents from sewage treatment works operated by the Water Companies. We inspected 86% of these.

6 COMPLIANCE

Numeric Consents

Table 3 summarises compliance of the main types of Discharges that are monitored and have Numeric Consents. Of all these discharges, 77.0% complied with their Consents. In 1994 this figure was 75.9%; in 1993 it was 75.1%. Appendix B gives details for Regions.

The figures on compliance are a good summary of the performance in 1995 but not such a good basis for showing change from year to year. Neither are they a good basis for comparing types of discharger. This is because the figures include performance against Absolute Limits (see Appendix A) and compliance with these standards is a function of sampling effort - the more sampling the larger the number of failed Discharges.

Table 3: Compliance with Numeric Consents				
Category	Total Number	Number Monitored	Number Compliant	Compliant Discharges (% of Monitored)
All Discharges with Numeric Consents	12,418	9,950	7,665	77.0
Sewage Treatment Works operated by the Water Companies	4,267	4004	3868	96.6
Sewage Treatment Works not operated by the Water Companies	3,162	2404	1281	53.3
Trade Discharges	4,989	3542	2516	71.0

Table 3 also indicates that the performance of the sewage treatment works operated by the Water Companies is much better than that of other discharges and other types of discharger. Appendix A explains that the methods of assessing compliance have to differ for different types of discharger. Nonetheless, when account is taken of these differences, the performance of the sewage treatment works operated by the Water Companies, remains better than that of other types of discharger.

Table 4 further illustrates the performance of sewage treatment works operated by Water Companies. It covers only the 95-percentile standards - standards well placed to provide useful summary statistics because compliance is not so sensitive either to differences in sampling rates, or to the number of Consents that also have Absolute Limits.

Table 4 shows that 97.8% of discharges comply with their 95-percentile (Look-up Table) Standards. The figure was 95.5% in 1993 and 97.0% in 1994

In theory, a result in excess of 95% is compatible with a true position in which all discharges comply with all their 95-percentile standards. This is because the use of sampling to assess compliance produces an unavoidable risk of up to 5% that a compliant discharge will be reported wrongly to have failed.

Descriptive Consents

Table 5 deals with all the Discharges with Descriptive Consents. Appendix B gives details for Regions.

Table 4: Compliance with 95-Percentile Standards of Sewage Treatment Works Operated by the Water Companies

Region	Total Number	Number Monitored	Number Compliant	% of Monitored that Comply
Anglian	687	686	674	98.3
North East	636	463	448	96.8
North West	356	356	353	99.2
Midlands	757	731	729	99.7
Southern	265	253	250	98.8
South West	497	497	459	92.4
Thames	367	367	362	98.6
Welsh	648	617	608	98.5
England and Wales	4,213	3,970	3,883	97.8

Table 5: Compliance with Descriptive Consents

Category	Number of Significant Discharges	Number Monitored	Compliant Discharges	
			Number	% of Monitored
All Significant Discharges with Descriptive Consents	3,068	1,996	1,843	92.3
Sewage Treatment Works operated by the Water Companies	1,786	1,532	1,414	92.3
Other Discharges	1,282	464	429	92.5

Changes Since 1990

In 1993 we introduced a more tightly defined reporting standard for the assessment of compliance. This change was responsible for the appearance of a small reduction in performance from 1992 to 1993.

The position for sewage treatment works operated by the Water Companies is shown in Table 6. The improved compliance from 1990 to 1992 has been maintained and performance improved from 94.2% in 1993 to 96.6% in 1995. As discussed in Section 6, this modest success masks a big reduction in the amount of pollution actually discharged. This is because Consents have been tightened in recent years - the change in the legal position is a big underestimate of the true change in the quality of the discharges.

Figures like those in Table 6 are sensitive to the numbers of discharges that have Upper-tier Consents. And compliance against Upper-tier Consents depends on the sampling rate - the more samples, the greater the number of failed discharges.

A better indication of the true trend is given by compliance against 95-percentile standards. These improved from 95.5% in 1993, to 97.0% in 1994, and to 97.8% in 1995 (Table 7).

Table 6: Compliance of Sewage Treatment Works Operated by the Water Companies with all Numeric Standards (1990 - 1995)						
Region	% of Monitored that Comply					
	1990	1991	1992	1993	1994	1995
Anglian	88	92	98	96.1	96.9	97.8
Midlands	91	98	98	96.4	98.9	98.2
North East	95	95	95	95.3	95.5	95.9
North West	96	97	98	97.2	97.5	97.8
Southern	88	94	99	97.7	98.9	98.9
South West	87	87	85	84.4	89.0	89.7
Thames	92	94	95	95.1	95.1	97.8
Welsh	87	95	96	93.1	93.7	97.1
England and Wales	90	94	95	94.2	95.6	96.6

Similar figures are given for Trade Discharges in Table 8. There is an apparent improvement in some Regions and an apparent decline in others. This may reflect changes in the numbers of discharges that are monitored.

Table 7: Compliance of Sewage Treatment Works Operated by the Water Companies with 95-percentile Standards (1993-1995)

Region			
	1993	1994	1995
Anglian	97.1	97.8	98.3
Midlands	98.6	98.0	96.8
North East	95.3	95.5	99.2
North West	98.0	99.9	99.7
Southern	85.4	91.7	98.8
South West	97.7	98.8	92.4
Thames	95.7	95.9	98.6
Welsh	96.2	97.2	98.5
England and Wales	95.5	97.0	97.8

Table 8: Compliance with Numeric Consents of Trade Discharges

Region	% of Monitored that Comply					
	1990	1991	1992	1993	1994	1995
Anglian	35	41	41	59	66	68.9
Midlands	67	74	72	72	77	79.2
North East	62	66	69	84	76	74.5
North West	77	75	71	74	75	79.0
Southern	53	41	42	48	42	55.6
South West	83	54	53	61	41	42.0
Thames	70	72	73	76	72	77.1
Welsh	37	43	41	50	56	59.1
England and Wales	74	67	67	71	69	71.0

7 REDUCTIONS IN POLLUTION

River water quality improved by 28% from 1990 to 1995. Over the same period, the biological quality improved by 26%. A substantial part of this improvement has been caused by reductions in pollution, particularly from sewage treatment works.

To assess true changes in discharge quality (as opposed to changes in the legal position) we need to assess past data on discharge quality against a fixed set of Consent Conditions, say, those in force in December 1995.

Table 9 shows the average concentration of BOD and Ammonia discharged to rivers from 3700 sewage treatment works. It shows also how these have reduced since 1990. Over England and Wales the load of BOD has reduced by 25 % and Ammonia by 36 %. Details for Regions are in Appendix B (Tables B10a, B10b, B10c and 11).

In calculating these averages the value for each works was scaled by the population served by the works. This means that the reductions in concentration are good estimates of the reduction in the polluting load discharged to rivers.

Expressed in terms of the Consents in force in 1995, the population served by works that fail the prime 95-percentile standards in Consents has declined from 18.7 to 6.4 %. The number of failed works has come down from 12.9 to 1.9%. Details for Regions are in Appendix B (Table B11).

Table 9: Performance of Sewage Treatment Works from 1990 to 1995				
Region	Mean BOD in 1995 (mg/l)	Reduction since 1990 (%)	Mean Ammonia in 1995 (mgN/l)	Reduction since 1990 (%)
Anglian	5.3	21	1.8	28
Midlands	8.4	29	3.3	42
North East	15.7	22	5.2	47
North West	11.3	8	6.6	23
Southern	7.3	21	1.7	23
South Western	9.1	22	2.4	18
Thames	5.2	39	2.8	23
Welsh	9.2	43	4.2	36
England & Wales	9.2	25	3.7	36

8 ENFORCEMENT

We use the results of our routine monitoring to decide cases for which we issue warnings to dischargers or take legal action through the courts. In making these decisions we take care to manage the risk of prosecuting compliant discharges that have been reported wrongly as failures by routine monitoring (an issue that we discuss later), or by results affected by the statistical errors in chemical analysis.

A failure of Consent that is so bad as to cause a pollution incident like a fish kill or a complaint is handled by special procedures and policy. These are described elsewhere². Our response to other failures is to treat them as evidence of heightened risk of damage to the Environment, as set out below.

Absolute Limits and Upper-tiers

Whenever a routine sample indicates a clear breach of Consent (in other words - supportable within the errors of chemical analysis) the next sample will be taken with the extra formal procedures that we judge necessary to support legal action. If this sample shows a clear breach, prosecution will normally follow. Sampling in this manner will continue on a routine basis until we are satisfied that the discharge complies. This will usually be when all the samples taken over three months comply.

95-percentile Standards

Whenever any sequence of 12 consecutive months of routine sampling indicates a breach of Consent all subsequent routine samples will be taken with a view to prosecution. This will continue until:

sufficient data have been collected for a prosecution; or,

a set of results for the immediate past 12 months complies.

² *Water Pollution Incidents in England and Wales - 1994. NRA Water Quality Series. No. 25. July 1995.*

9 PROSECUTIONS

The number of prosecutions is much lower than the number of failures detected by routine monitoring. One reason for this is that, on being told of a failed sample, most dischargers will take quick action to improve the quality of the discharge. This corrects the problem, whilst making it unlikely that a case can be made for prosecution.

Even if dischargers paid no heed to our warnings, we would always find cases where, for reasons of chance, an initial failure of routine samples, was not followed by similar failures in subsequent samples.

The reported number of failures includes both marginal and substantial failures. We tend not to take prosecutions for single samples where the failure was small and within the errors expected from chemical analysis.

Marginal failures are useful in drawing attention to the potential for more serious events and we are increasingly issuing warning letters for marginal failures. These warnings are an appropriate alternative to court action³.

At the aggregate level, our data give precise estimates of the number of failures in Regions or in England and Wales. These are good estimates of performance. However the same degree of precision cannot be achieved in identifying failures of Consents at individual discharges. It is inherent in the statistical process of using data to decide compliance, that some marginal failing discharges will escape detection, and that some compliant discharges will be treated as failures. As discussed above, this is reflected in our policy on enforcement.

The result is that the numbers of prosecutions will be small compared with the number of failures inferred from summary statistics. In a typical year, we take about 60 prosecutions for failure to meet Consent conditions. About 95 % of prosecutions are successful.

³ *Water Pollution Incidents in England and Wales - 1994. NRA Water Quality Series. No. 25. July 1995.*

GLOSSARY

ABSOLUTE LIMIT: A numerical standard that must never be exceeded. The term is usually applied to all determinands in the Consents for discharges not operated by the Water Companies and to the Non-sanitary Determinands for the sewage treatment works operated by the Water Companies. Sanitary Determinands for the sewage treatment works operated by the Water Companies are controlled by Percentile Standards although Absolute Limits (as Upper-tier Limits) may also be applied with the Percentiles .

AMMONIA: A chemical found in water often as a result of pollution by sewage effluents. Ammonia affects fisheries and abstractions for potable water supply.

BIOCHEMICAL OXYGEN DEMAND (BOD): A measure of the amount of oxygen consumed in water, usually by Organic Pollution. Oxygen is vital for life and so measurement of the BOD tests whether pollution could affect aquatic animals.

COMBINED SEWER OVERFLOWS: Most sewers receive flows of sewage and flows of rainfall that run off our roads and paved areas. After heavy rainfall, the flows in the sewer may exceed the capacity of the sewers or the capacity of sewage treatment works. Combined Sewer Overflows allow the dilute and excess flow to discharge to a receiving water. The conditions under which flows may overflow into receiving waters are specified in the Consent.

CONTROLLED WATER: Waters for which the Agency is responsible: including all rivers, canals, lakes, groundwaters, estuaries and coastal waters to a distance of 3 miles offshore.

DESCRIPTIVE CONSENT: A Consent describing qualitatively the type of treatment required, or polluting effects to be avoided, rather than a set of numerical limits on the quality of the discharge. It is normally used for small sewage works.

DETERMINAND: A general name for a characteristic or aspect of water quality. Usually a feature which can be described numerically as a result of scientific measurement.

EMERGENCY OVERFLOWS: The sewerage system contains items like pumping stations which could sometimes be subject to an emergency such as mechanical failure. The conditions under which flows may be diverted into receiving waters are controlled by Consent.

ENVIRONMENTAL QUALITY STANDARD: A summary statistic, like a mean, percentile or maximum, that specifies the concentration of a Determinand in a receiving water that should not be exceeded if a specified use or attribute of that water is to be maintained.

EQUIVALENT POPULATION: A measure of the load of Organic Pollution. It is an estimate of the population served by the sewage treatment works plus an allowance for trade discharges to the sewer. The latter is expressed in terms of the number of extra people that would produce a load of pollution that is equivalent to the trade discharge.

INTERMITTENT DISCHARGES: Discharges of sewage that are made intermittently as a result of rainfall, (Combined Sewer-Overflow, Storm Tank discharge), or following an emergency such as power failure at a sewage pumping station.

INSPECTED DISCHARGES: Discharges, usually with Descriptive Consents, that are subject to pre-planned visits to assess compliance. The inspections may include checks on the receiving water.

LOOK-UP TABLE: The Look-up Table is the procedure used since 1985 in England and Wales, for assessing compliance with 95-percentile standards in the Consents of discharges from sewage treatment works operated by the Water Companies. The Look-up Table is a list, for various sampling rates, of the maximum number of exceedences allowed in a period of 12 months. A truncated version is shown below

The Look-up Table	
Number of Samples	Permitted Number of Failed Samples
4 - 7	1
8 - 16	2
17 - 28	3
29 - 40	4
41 - 53	5
	etc

MONITORED DISCHARGE: A Monitored Discharge is subject to routine Inspection or sampling of the receiving water or the discharge itself.

NON-NUMERIC CONSENT: A Consent that has no numeric limit on discharge quality, but relies on specification of a numeric process variable, such as flow, in order to achieve the required degree of environmental protection. This type of Consent is normally used for Combined Sewer Overflows and Emergency Overflows.

NON-SANITARY DETERMINANDS: Determinands which are not generally associated with sewage treatment. They include nutrients as well as metals and other Dangerous Substances. Consent Standards are almost always expressed as Absolute Limits. In many cases, Non-sanitary Determinands in sewage effluents are the result of trade discharges to the sewer.

NON-WATER COMPANY DISCHARGES: All Point Source Discharges not made by the Water Companies. The discharges made by all other traders and private individuals. Most of these discharges are made from small sewage works and small Trade premises and these tend to have Descriptive Consents(ibid).

NUMERIC CONSENT: A Consent in which numeric criteria are set (as absolute limits or percentiles), on the quality, concentration or load of any substance, and on the discharge flow.

ORGANIC POLLUTION: A term used to describe the type of pollution which through the action of bacteria consumes the oxygen dissolved in rivers. It applies to the effects of sewage, treated sewage effluents, farm wastes and the waste from many types of industry like dairies, breweries and abattoirs.

PERCENTILE LIMIT: A numeric limit that must be achieved or bettered for at least some stated percentage of time over a specified assessment period. For example, a 95-percentile limit must be met for at least 95% of a specified time period, for example, 1 year (see Look-up Table).

POINT SOURCE DISCHARGE: Discharges from a fixed point - a pipe, for example. It is these discharges that can be controlled by Consent.

PROCESS EFFLUENT: Types of Trade Discharge. The liquid waste from industrial and commercial processes as distinct from the drainage from sites.

PUBLIC REGISTERS: Records of Consents and analysis of effluents and waters that are available for inspection by any member of the public. The Registers are located at the Agency's Regional Offices.

RECEIVING WATER: Water to which effluents discharge. This covers all Controlled Waters : rivers, canals, lakes, groundwaters, estuaries and coastal waters to a distance of 3 miles offshore.

SANITARY DETERMINANDS: The pollutants commonly associated with sewage treatment. These are Suspended Solids, Biochemical Oxygen Demand (BOD) and Ammonia.

SEPTIC TANKS: Septic tanks are small sewage treatment facilities which normally serve individual domestic premises.

SIGNIFICANT DISCHARGES: The term "significant" is applied to Point Source Discharges that are Consented for more than 5 cubic metres of volume per day, but also includes some smaller discharges where the type of discharge and location of the discharge make it important enough to require Monitoring. They are subject to Numeric Consents.

SITE DRAINAGE: Drainage from sites used for industrial, commercial or domestic purposes. This may be collected in surface water sewers or drains that discharge to a receiving water.

STORM SEWAGE: The high flows of sewage that can reach the sewerage system or the sewage treatment works at times of heavy rainfall.

STORM TANKS: Sewage treatment works are designed to treat a specific flow of sewage. High flows in excess of this level, caused usually by storms, are passed into Storm Tanks. The aim is to pass the stored volumes to the sewage treatment works when the flows have receded.

STORM TANK OVERFLOWS: If the Storm Tanks are not big enough to take all the Storm Sewage, perhaps because the storm is particularly severe, the surplus flow may spill over into a receiving water. The conditions under which this can happen are specified in the Consent. Storm tank discharges consist of dilute sewage, after some settlement of suspended, potentially polluting, material.

SURFACE WATER DISCHARGES: In this report, the run-off from roads, buildings and land. This may be subject to Consent where it enters watercourses. (Not to be confused with the term Surface Water which is sometimes used for any Controlled Water which is not groundwater.)

SUSPENDED SOLIDS: Solid organic or inorganic material maintained in suspension by the turbulence of effluent or receiving water flow. These solids may settle when the flow velocity drops, possibly smothering bottom dwelling aquatic organisms or creating a localised oxygen demand.

TRI-PARTITE SAMPLE: A sample taken in the presence of a witness and split into three parts. One part is analysed by the Agency, one is given formally to the discharger and one is kept aside to allow an independent check. This type of sample is generally the only type of official or regulatory sample formally admissible as legal evidence.

UPPER-TIER CONSENT: An Absolute Limit generally a multiple of the 95-Percentile Limit, that may be included with the 95-percentile in the Numeric Consents for sewage treatment works operated by the Water Companies.

WATER COMPANY DISCHARGES: Point Source Discharges made by the ten Water Service Public Limited Companies, (Water and Sewerage Undertakers), in England and Wales.

APPENDIX A: ASSESSMENT OF COMPLIANCE

We report a discharge as compliant when our monitoring programme shows that it conforms fully with the limits set in its Consent.

Discharges from Sewage Treatment Works Operated by the Water Companies

Numeric Consents for these generally contain 95-percentile Standards for Sanitary Determinands. They may also include Upper-tier Standards for Sanitary Determinands and Absolute Limits for Non-sanitary Determinands.

To be declared Compliant in this report, the discharge must not fail any of the standards in its Consent.

95-Percentile Standards

These standards must be met for 95 % of a 12 month period. A certain number of sample results may exceed the limit in any period of 12 complete months. The number of permitted failures is laid down in a Look-up Table. This is referred to in the Consent. If the number of failed samples is more than the number permitted by the Look-up-Table, then we are 95 % certain that the failure is not due to chance. We report the discharge has having failed its 95-Percentile Standard.

These are the only types of standards for which the rules for assessing compliance follow statistical principles. For this reason performance against 95-percentile standards has a special role in showing trends.

Descriptive Consents

A discharge with a Descriptive Consent is judged by Inspections, as opposed to the analysis of chemical samples. We record the discharge compliant if it passes its set of inspections in the reporting period.

Discharges not Operated by the Water Companies

The Numeric Consents have Absolute Limits whether for Sanitary or Non-sanitary Determinands. 95-percentiles are hardly ever used. Absolute Limits may not be exceeded in any sample.

In most cases the numbers set in these discharge standards start out as values calculated as 95-percentiles. But they appear in the Consent as Absolute Limits. For this reason, all else being equal, the performance of these discharges will always appear worse than those of the Water Companies.

APPENDIX B: INFORMATION FOR REGIONS

Table B1: Numbers of Discharges with Numeric Consents				
Region	Total	Sewage Treatment Works Operated by Water Companies	Other Sewage Treatment Works	Trade Discharges
Anglian	1,398	687	379	332
Midlands	2,616	757	615	1,244
North East	2,812	636	552	1,624
North West	1,042	356	108	578
Southern	946	287	468	191
South West	1,085	511	308	266
Thames	1,096	367	425	304
Welsh	1,783	666	307	810
England & Wales	12,778	4,267	3,162	5,349

Table B2: Numbers of Discharges with Descriptive Consents			
Region	Total	Sewage Treatment Works Operated by Water Companies	Other Discharges
Anglian	687	345	342
Midlands	439	231	208
North East	490	423	67
North West	219	219	-
Southern	578	101	477
South West	285	261	24
Thames	0	0	-
Welsh	370	206	164
England & Wales	3,068	1,786	1,282

Table B3a: Monitoring of Numeric Consents			
Region	Sewage Treatment Works Operated by Water Companies		
	Number	Number Monitored	% Monitored
Anglian	687	686	99.9
Midlands	757	731	96.6
North East	636	463	72.8
North West	356	356	100.0
Southern	287	275	95.8
South West	511	505	98.8
Thames	367	367	100.0
Welsh	666	621	93.2
England & Wales	4,267	4,004	93.8

Table B3b: Monitoring of Numeric Consents for Trade Discharges			
Region	Number	Number Monitored	% Monitored
Anglian	332	296	89.2
Midlands	1,244	930	74.8
North East	1,624	654	40.3
North West	578	505	87.4
Southern	191	126	66.0
South West	266	257	96.6
Thames	304	297	97.7
Welsh	810	477	58.9
England & Wales	5,349	3,542	66.2

Table B3c: Monitoring of Numeric Consents for Sewage Treatment Works not Operated by the Water Companies

Region	Number	Number Monitored	% Monitored
Anglian	379	330	87.1
Midlands	615	559	90.9
North East	552	200	36.2
North West	108	83	76.9
Southern	468	338	72.2
South West	308	273	88.6
Thames	425	423	99.5
Welsh	307	198	64.5
England & Wales	3,162	2,404	76.0

**Table B4a: Monitoring of Descriptive Consents for
Sewage Treatment Works Operated by the Water
Companies**

Region	Number	Number - Monitored	% Monitored
Anglian	345	296	85.8
Midlands	231	199	86.1
North East	423	404	95.5
North West	219	133	60.7
Southern	101	88	87.1
South West	261	238	91.2
Thames	0	0	-
Welsh	206	174	84.5
England & Wales	1,786	1,532	85.8

**Table B4b: Monitoring of Descriptive Consents for
Discharges Not Operated by the Water Companies**

Region	Number	Number Monitored	% Monitored
Anglian	342	226	66.1
Midlands	208	75	36.1
North East	67	51	76.1
North West	0	0	-
Southern	477	0	0.0
South West	24	18	75.0
Thames	0	0	-
Welsh	164	94	57.3
England & Wales	1,282	464	36.2

Table B5: Compliance for Discharges from Water Companies' Sewage Treatment Works

(Percent Compliant of those Discharges Monitored)

Region	All Discharges			Numeric Consents			Descriptive Consents		
	Number Monitored	Number Compliant	% Compliant	Number Monitored	Number Compliant	% Compliant	Number Monitored	Number Compliant	% Compliant
Anglian	982	961	97.9	686	671	97.8	296	290	98.0
Midlands	930	915	98.4	731	718	98.2	199	197	99.0
North East	867	822	94.8	463	444	95.9	404	378	93.6
North West	489	466	95.3	356	348	97.8	133	118	88.7
Southern	363	333	91.7	275	272	98.9	88	61	69.3
South West	743	636	85.6	505	453	89.7	238	183	76.9
Thames	367	359	97.8	367	359	97.8	0	0	-
Welsh	795	773	97.2	621	603	97.1	174	170	97.7
England & Wales	5,536	5,265	95.1	4,004	3,868	96.6	1,532	1,397	91.2

**Table B6: Compliance for Discharges from Water Companies' Sewage Treatment Works
(FOR VARIOUS TYPES OF STANDARDS IN NUMERIC CONSENTS)**

(Percent Compliant of those Discharges with the Type of Standard and Monitored)

Region	With all Numeric Standards			With 95-percentile Standards			With Upper-tier Standards			With Non-sanitary Standards		
	Number Monitored	Number Compliant	% Compliant	Number Monitored	Number Compliant	% Compliant	Number Monitored	Number Compliant	% Compliant	Number Monitored	Number Compliant	% Compliant?
Anglian	686	671	97.8	686	674	98.3	52	49	94.2	36	35	97.2
Midlands	731	718	98.2	731	729	99.7	145	142	97.9	68	58	85.3
North East	463	444	95.9	463	448	96.8	51	49	96.1	19	13	68.4
North West	356	348	97.8	356	353	99.2	29	27	93.1	24	21	87.5
Southern	275	272	98.9	253	250	98.8	38	38	100.0	10	9	90.0
South West	505	453	89.7	497	459	92.4	121	100	82.6	26	20	76.9
Thames	367	359	97.8	367	362	98.6	8	8	100.0	19	16	84.2
Welsh	621	603	97.1	617	608	98.5	86	81	94.2	120	115	95.8
England & Wales	4,004	3,868	96.6	3,970	3,883	97.8	530	494	93.2	322	287	89.1

Table B7: Compliance of Discharges not made by the Water Companies
(Percent Compliant of Discharges Monitored)

Region	Sewage Treatment Works with Numeric Standards			Trade Discharges with Numeric Standards			All Discharges with Descriptive Standards			All Types of Discharge and Consents		
	Number Monitored	Number Compliant	% Compliant	Number Monitored	Number Compliant	% Compliant	Number Monitored	Number Compliant	% Compliant	Number Monitored	Number Compliant	% Compliant?
Anglian	330	165	50.0	296	204	68.9	226	205	90.7	852	574	67.4
Midlands	559	321	57.4	930	737	79.2	75	75	100.0	1,564	1,133	72.4
North East	200	135	67.5	654	487	74.5	51	40	78.4	905	662	73.1
North West	83	33	39.8	505	399	79.0	-	-	-	588	432	73.5
Southern	330	170	51.5	126	70	55.6	-	-	-	456	240	52.6
South West	273	109	39.9	257	108	42.0	18	17	94.4	548	234	42.7
Thames	423	269	63.6	297	229	77.1	-	-	-	720	498	69.2
Welsh	198	79	39.9	477	282	59.1	94	92	97.9	769	453	58.9
England & Wales	2,396	1,281	53.5	3,542	2,516	71.0	464	429	92.5	6,402	4,226	66.0

Table B8: Compliance for Discharges from Water Companies' Sewage Treatment Works
(Percent Failing of Total Number of Discharges)

Region	All Discharges			Numeric Consents			Descriptive Consents		
	Number	Number Failing	% Failing	Number	Number Failing	% Failing	Number	Number Failing	% Failing
Anglian	1,032	21	2.0	687	15	2.2	345	6	1.7
Midlands	988	15	1.5	757	13	1.7	231	2	0.9
North East	1,059	45	4.2	636	19	3.0	423	26	6.1
North West	575	23	4.0	356	8	2.2	219	15	6.8
Southern	388	30	7.7	287	3	1.0	101	27	26.7
South West	772	107	13.9	511	52	10.2	261	55	21.1
Thames	367	8	2.2	367	8	2.2	0	0	-
Welsh	872	22	2.5	666	18	2.7	206	4	1.9
England & Wales	6,053	271	4.5	4,267	136	3.2	1,786	135	7.6

**Table B9: Compliance for Discharges from Water
Companies' Sewage Treatment Works
(WITH 95-PERCENTILE STANDARDS)**

(Percent Failing of Total Number of Discharges)

Region	Number	Number Failing	% Failing
Anglian	687	8	1.16
Midlands	636	2	0.31
North East	356	15	4.21
North West	757	3	0.40
Southern	265	3	1.13
South West	497	42	8.45
Thames	368	5	1.36
Welsh	648	9	1.39
England & Wales	4,214	87	2.06

**Table B10a: Performance of Sewage Treatment Works
Operated by the Water Companies and Discharging to Rivers
(1990 - 1995)**

Region	% of Samples Failing 1995 Consent Limits for Suspended Solids					
	1990	1991	1992	1993	1994	1995
Anglian	7.1	5.5	2.8	2.5	1.9	1.7
Midlands	2.1	1.7	0.7	0.5	0.3	0.2
North East	12.9	10.6	9.2	4.7	4.3	6.3
North West	3.0	2.7	1.4	2.6	1.0	0.7
Southern	6.0	1.9	0.9	1.0	1.4	0.4
South West	5.9	4.6	4.6	3.6	3.4	2.4
Thames	4.8	3.5	1.7	1.6	3.1	2.1
Welsh	8.2	4.4	2.5	2.6	1.5	1.5
England and Wales	5.8	4.3	3.0	2.1	1.9	2.1

**Table B10b: Performance of Sewage Treatment Works
Operated by the Water Companies and Discharging to Rivers
(1990 - 1995)**

Region	% of Samples Failing 1995 Consent Limits for BOD					
	1990	1991	1992	1993	1994	1995
Anglian	4.6	5.6	3.5	4.2	1.8	1.9
Midlands	3.8	3.2	1.4	1.9	1.4	0.6
North East	20.0	10.3	7.0	3.8	3.4	3.4
North West	2.3	2.5	1.9	3.0	2.2	1.3
Southern	3.7	1.5	0.5	0.4	0.6	0.5
South West	5.3	4.2	3.9	2.8	2.1	1.9
Thames	6.1	5.0	0.8	1.2	2.5	2.5
Welsh	6.8	5.9	3.5	3.9	3.4	2.2
England and Wales	7.2	4.9	2.7	2.5	2.1	1.8

**Table B10c: Performance of Sewage Treatment Works
Operated by the Water Companies and Discharging to Rivers
(1990 - 1995)**

Region	% of Samples Failing 1995 Consent Limits for Ammonia					
	1990	1991	1992	1993	1994	1995
Anglian	4.3	2.6	1.2	1.5	0.5	0.6
Midlands	5.9	4.7	2.0	0.6	0.2	0.5*
North East	7.9	5.0	4.1	4.4	1.1	2.2
North West	5.0	5.1	4.0	4.4	1.4	0.5
Southern	2.0	1.3	0.6	0.2	0.4	0.3
South West	3.2	2.3	2.2	1.3	1.4	1.2
Thames	8.1	4.3	1.3	1.4	1.1	1.6
Welsh	5.1	3.1	1.0	1.2	1.4	1.0
England and Wales	5.9	4.3	2.5	2.1	0.8	1.0

**Table 11: Performance of Sewage Treatment Works Operated
by the Water Companies (1990 - 1995)**

Region	% Population Equivalent Served By Failed Works					
	1990	1991	1992	1993	1994	1995
Anglian	20.3	26.3	13.3	11.2	5.5	5.2
Midlands	20.9	8.8	7.9	6.0	0.2	0.5
North East	32.2	32.4	22.6	22.6	18.4	22.0
North West	8.7	8.6	7.0	8.8	4.6	1.8
Southern	5.3	2.6	0.5	0.2	0.0	0.4
South West	13.9	13.5	6.5	7.6	5.6	3.8
Thames	17.5	16.4	2.3	1.4	2.9	5.4
Welsh	10.3	10.1	4.1	3.8	3.7	6.6
England and Wales	18.7	15.5	9.6	8.9	5.3	6.4