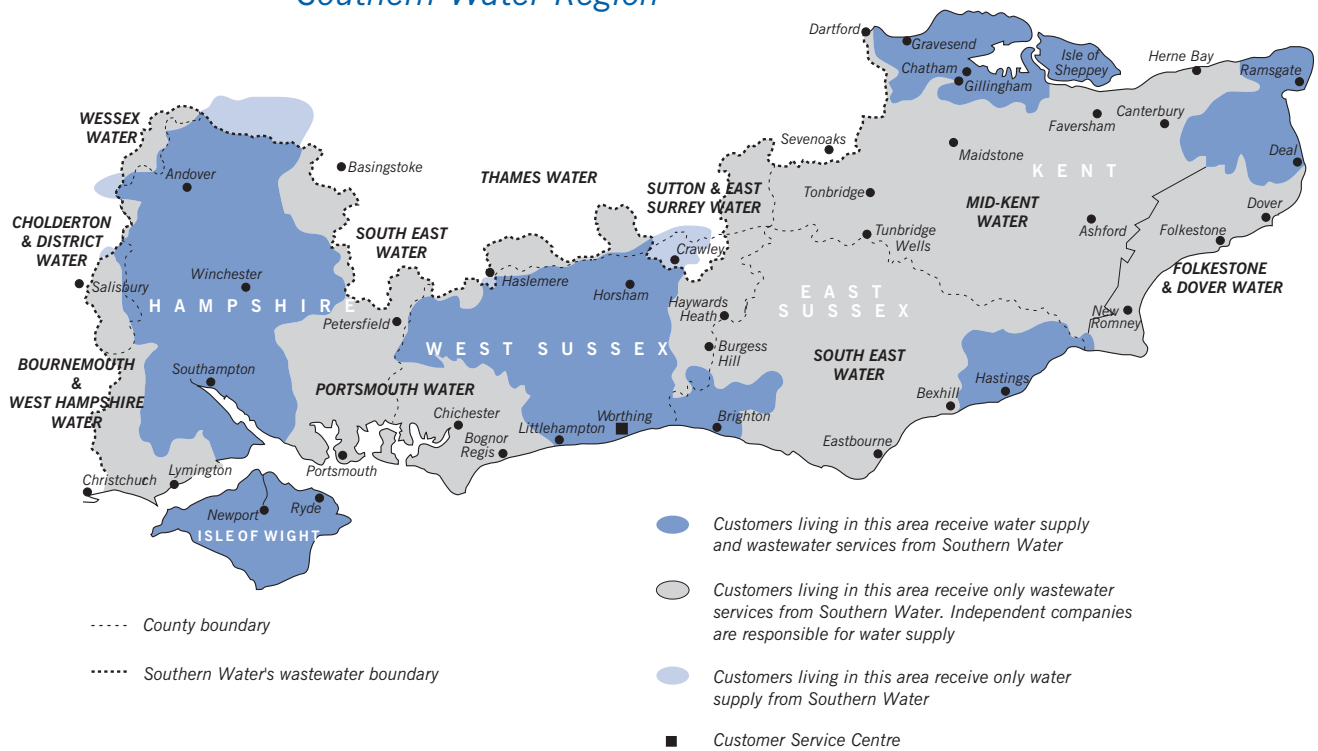


# Drinking Water Quality Report

## 2002



## Southern Water Region



Maps that give details of water supply zones can be inspected at the address given at the back of this report.

## Southern Water in 2002

Microbiological Compliance*	<b>99.92%</b>
Overall Compliance	<b>99.88%</b>
Capital investment in water supply schemes 2001/2002	<b>£54 million</b>
Volume of water supplied	<b>598 MI/d</b>
Population supplied	<b>2.26 million</b>
Length of water main	<b>13,350 km</b>
Number of water supply works	<b>95</b>
Number of service reservoirs	<b>210</b>
Number of water supply zones	<b>116</b>
Number of tests taken for compliance reasons	<b>70,946</b>
Number of tests taken for all reasons (monitoring and compliance)	<b>373,530</b>

\* Combined Total Coliform and *E Coli* parameter

## Foreword

I am proud to present Southern Water's Drinking Water Quality Report for 2002.



Each year, Southern Water continues to provide its customers with a high quality drinking water supply. In 2002 drinking water quality remained excellent, with overall compliance with the standards at 99.88%. The challenge for the future is to maintain this position, year on year.

I am also pleased to report that in 2001 for the two comparative indexes introduced by Drinking Water Inspectorate (DWI), Overall Quality Index and Operational Performance Index, we were placed in the 'Statistically Significantly Above Average' category. A position we aim to maintain. We will know the results for 2002 in July when DWI publish their report.

We cannot relax and remain watchful of any changes that may affect water quality, to ensure there is no deterioration. We conduct a comprehensive programme of testing from the raw water to the customers' taps. Last year over 370,000 tests were analysed. Continued investment is essential to ensure our supplies meet the required standards and remain of the highest quality. During 2002 work was completed at our Testwood Water Supply Works and other works to improve the disinfection process and an extensive refurbishment was completed at our Hardham Water Supply Works. Further work was completed on the scheme we have in place to ensure we can meet the new stringent standard for lead.

The role played by the people who work at Southern Water in the achievement reported here cannot be underestimated. The professional dedication shown by staff to quality is an important part of the whole process towards reaching our goal of 100% compliance.

Finally, more and more people are aware that drinking water is good for them. Drinking 7 or 8 glasses of water a day is recommended for good health. Southern Water continue to work hard to ensure that customers can be confident that each time they turn on their kitchen tap their drinking water is safe and of a quality to match the best in the country.



**Martin Baggs**  
Operations Director

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# Southern Water

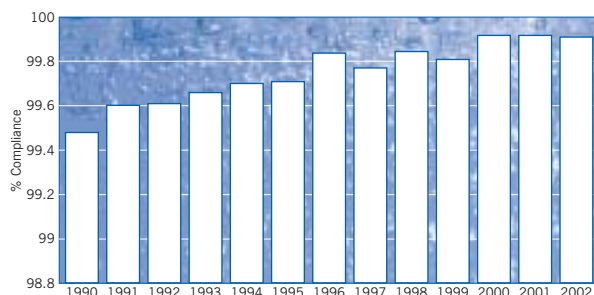
WATER SUPPLY (WATER QUALITY) REGULATIONS 1989  
REGULATION 31 REPORT ON WATER QUALITY FOR 2002

## 1. Overall Compliance

**In 2002, to measure compliance with the Regulations, 70,946 determinations were carried out on parameters having a prescribed concentration or value (PCV), and 99.88% of these tests complied with the standard. The summary tables supplied with this report provide more detail on compliance with the Regulations. They demonstrate that the drinking water supplied by Southern Water is of a high quality.**

**It should be noted, that water quality standards in the Water Quality Regulations necessarily provide a wide margin for safety. A water quality standard failure does not mean there is any risk to public health. All samples that fail the standards are investigated in full, and remedial action taken if required.**

Overall Compliance 1990 – 2002



To maintain drinking water quality at these high levels, a programme of investment at water supply works, and in the distribution systems, will be continued. During 2002, the ongoing programme of routine inspection, cleaning and improvement at service reservoirs was continued. Improvement and refurbishment schemes were completed at a number of water supply works including the completion of a major refurbishment of the surface water works at Hardham, and upgrading of disinfection systems at Testwood Water Supply Works (WSW) and other works.

Southern Water has an ISO9002 accredited Quality Management System in place, which includes a programme of detailed audits of systems and procedures associated with the treatment and supply of drinking water. This provides confidence that the high quality of our drinking water supplies is maintained and continued improvement is achieved.

Each year, the Drinking Water Inspectorate (DWI) carries out technical audits of the steps taken by Southern Water to comply with the Regulations. Last year the inspections covered;

- detailed audit trails of sample results and follow up actions;
- progress with mains renovation schemes;

- procedures for the collection and transport of compliance samples;
- inspection of water supply works and service reservoirs;
- audit of plumbosolvency treatment and control programmes of work.
- procedures for handling of and response to customer complaints related to water quality.

The DWI Chief Inspector's Report 2002 will provide an independent report of these audits and on the quality of water supplied by Southern Water, along with all water companies, during the past year. This is due to be published during July 2003, and will be available on the DWI website.

## 2. Microbiological Quality

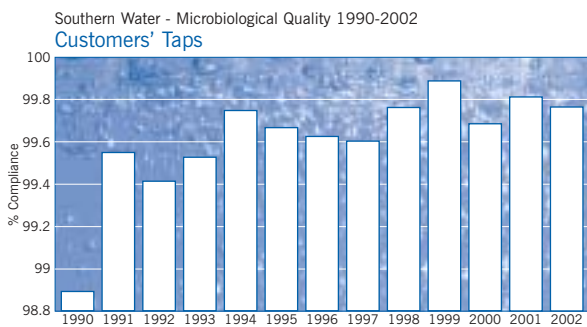
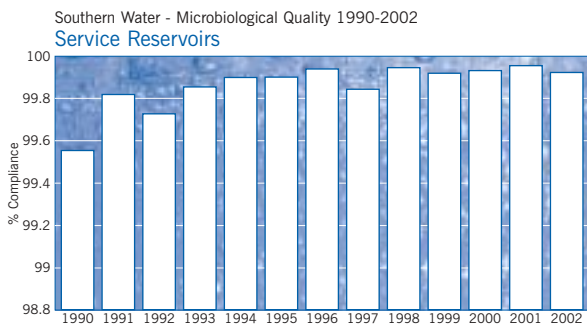
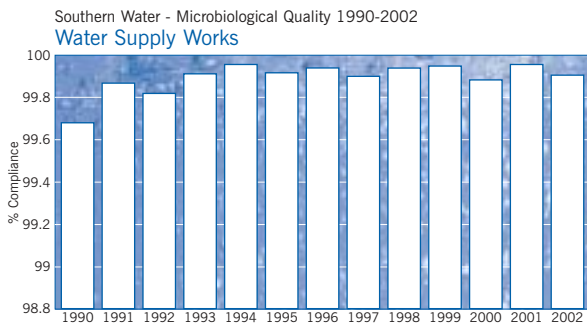
**In 2002 high microbiological quality has been maintained overall. The reported results are for the initial compliance samples only, and indicate very good quality.**

% Samples free from coliform bacteria		
	Total Coliforms	Faecal Coliforms
Customers' Taps	99.78 %	99.98 %
Service Reservoirs	99.83 %	99.96 %
Treated Waters	99.95 %	100 %

**All 116 zones passed the 95% standard set by the Regulations for total coliforms. Of the 210 service reservoirs used during 2002, 209 of these passed the 95% standard for total coliforms. Of the 95 treatment works in supply during the year, 91 did not have coliforms detected.**

Water leaving treatment works is disinfected to eliminate any potentially harmful micro-organisms which may be present in the raw water. Within Southern Water's area water is disinfected by either the addition of chlorine or by the use of ultra violet light. In both cases the water leaving the works has a small amount of chlorine added to maintain the quality of the water, as it travels through the distribution system, to our customers' taps. The effectiveness of this treatment process and the integrity of the distribution system are measured by analysing the water samples for coliform bacteria. Coliforms are a group of bacteria, not normally pathogenic, which occur extensively in nature. A sub-group, faecal coliforms, may be an indicator of possible pollution of water supplies.

**The method of testing is extremely sensitive and coliforms can also indicate the hygienic condition of the sampling location. Each occasion coliforms are detected, re-sampling and investigations are initiated to establish any remedial action that may be needed.**



### 3. Physico – Chemical Quality

**In 2002, 21,912 determinations were carried out on samples from customers' taps for physico – chemical determinands. Of these, 99.80% complied with the relevant water quality standard. Details of the determinands for which samples exceeded the PCV are given in Table 4.**

**These exceedences were confined to three determinands. Compliance with all the standards was achieved in 91 of the 116 water quality zones in 2002. This equates to 78% of zones achieving all standards compared with 31% in 1992.**

**The actual number of physico – chemical PCV exceedences has reduced significantly in the last 10 years to 44 in 2002. The majority of the exceedences, 34 out of 44, were due to one parameter, polycyclic aromatic hydrocarbons (PAH) from coal tar lined mains.**

Samples taken from customers' taps for the compliance monitoring programme, required by the Regulations, are routinely tested for over 100 determinands. The standards set by the Water Regulations are very stringent and set with a wide margin for safety. Failing a standard does not mean there is any risk to public health but all samples which breach the standards are followed up and investigated in full.

Explanatory notes of determinands of interest, including those that breached in 2002, are provided below:

#### Iron

**In 2002, for the first year ever, there were no exceedences of the iron standard. This achievement is largely due to the completion of the renovation of 648 km of iron mains that started in 1995.**

Iron above the Regulation standard of 200 µg/l does not pose any risk to health. However, it may give rise to discolouration and occasionally particles in the water. Iron in water can originate from a number of sources including the source water, the pipe it is transported through and a customer's own pipework.

#### Nitrate

**In 2002 there were no exceedences of the nitrate standard.**

Nitrate arises from the use of fertilisers in agriculture and some sources are showing increasing levels especially after heavy rainfall. Southern Water has two schemes, nearing completion that will reduce the level of nitrates found in some of our water supply zones due to rising nitrate levels in groundwater sources.

#### Trihalomethanes

**In 2002 of the 530 tests carried out for THMs 98.68% complied with the PCV. In three zones, all supplied by the same treatment works, there were seven exceedences of the PCV for THM, and all zones exceeded the three-month average.**

Trihalomethanes (THMs) are formed by the reaction of chlorine with naturally occurring organic compounds in the water. An Undertaking was accepted in 2002 for THMs at the works supplying the zones with the failures. During 2002 operational improvements have been made and investigations were completed as a first step in a major capital scheme to refurbish the works.

#### Pesticides

**In 2002, 4906 determinations for individual pesticides were carried out on samples from customers' taps, with 100% complying with the PCV. This is the fourth consecutive year that we have achieved 100% compliance with the stringent European Union (EU) and UK Government standard of 0.1 µg/l.**

Southern Water carries out a comprehensive programme of monitoring for some 56 different pesticide compounds in raw water sources and from customers' taps. Protection of raw water supplies from contamination by pesticides is paramount in maintaining the highest drinking water quality. These residues arise from the widespread use of pesticides by many sections of society such as agriculture, local authorities, railways and domestic gardeners. Southern Water continues to encourage the 'safer' use of pesticides that minimise residues of these compounds entering water sources.

## Lead

**In 2002, 517 samples were taken for lead analysis of which 99.42% complied with the 50 µg/l standard set by the Regulations. This relates to three exceedences in 2002.**

The current UK standard of 50 µg/l is more stringent than that set by the original EU Directive, because it relates to an unflushed sample (i.e. water that has been standing in the pipe) rather than a flushed sample.

Lead was used in the past in service pipes (between the main and the property) and in the internal plumbing. When water comes into contact with lead pipes minute traces of lead can be picked up. The new EU Directive, which has been incorporated into the Water Supply (Water Quality) Regulations 2000, has reduced the standard limit to 10 µg/l to be met by the end of 2013, with provision for an interim standard of 25 µg/l to be met by the end of 2003.

The method of sampling and assessment against these new standards has not yet been finalised within the EU, however using the current methods, 99.23% and 97.68% of samples taken in 2002 had lead concentrations below the 25 µg/l and 10 µg/l standard limits respectively. This is an improvement on last years results of 98.82% and 96.3% respectively and is due to the installation of further treatment and the optimisation of plant already installed. We anticipate that further optimisation over the coming months will ensure that we achieve the 25µg/l and also the 10 µg/l standard for the future. Where optimisation of the treatment process will not meet the 10µg/l limit, replacement of communication pipes will be required.



To ensure levels of lead are minimised at the tap, customers will need to change any lead pipework they have in their plumbing and Southern Water encourages customers to do

this. Advice on this subject is available in a lead leaflet that is available on request from the Customer Service Centre at Worthing. If a sample is found to exceed the limit for lead in drinking water both the customer and local Environmental Health Officer (EHO) are notified. The Company replaces, free of charge, any lead pipework between the main and the property boundary, i.e. the communication pipe. In addition, if there is a leak on a lead underground supply pipe on the customers' property, Southern Water will replace any such pipe free of charge, up to a length of ten metres.

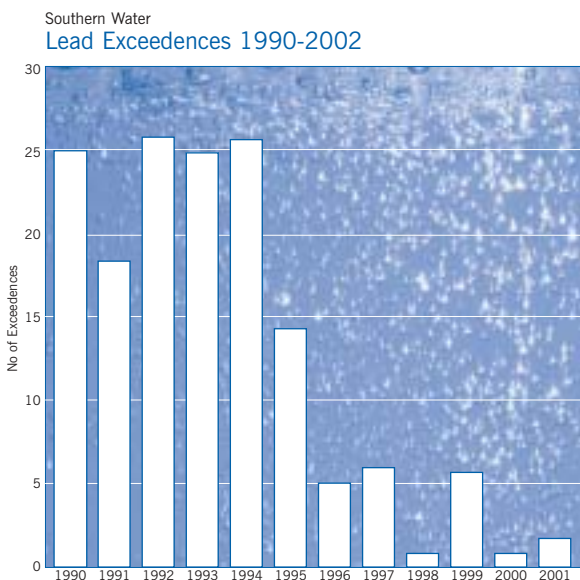
## Polycyclic Aromatic Hydrocarbons (PAH)

**In 2002, 563 samples were taken for PAH analysis of which 93.96 % complied with the standard for Total PAH and 100% complied with the PCV set for benzo-3,4- pyrene.**

PAH is a class of organic compounds that occur in soot, tar, vehicle exhausts and combustion products of fuels such as oil. They also occur in coal tar linings, used in the past to protect iron water mains from corrosion. Leaching of PAH from coal tar linings in distribution systems means that some water samples show residues of PAH above the current PCV of 0.2 µg/l for Total PAH. Of the average daily intake of PAH for an individual person, only a small proportion comes from drinking water.

The limit of 0.2µg/l for Total PAH in the Regulations is based on the previous EU Directive and specifies six individual PAH compounds to be monitored in the Total PAH group. The new Directive removes two of these individual compounds from the PAH group but tightens the standard for Total PAH to 0.1µg/l. One of the individual PAH to be removed is the compound fluoranthene. Within Southern Water's area, breaches of the current PAH standard have been largely due to the incidence of fluoranthene. Comparing 2002 results with this new standard would have resulted in no exceedences of the Regulations.

Benzo-3,4-pyrene is the second of the individual PAH to be removed from the Total PAH parameter. Instead, this compound is given its own standard of 0.01µg/l. Benzo-3,4-pyrene has always been recognised as being of more significance to health than other individual PAH and in the current Regulations it is necessary to achieve an average of less than 0.01µg/l over a year. Whilst benzo-3,4-pyrene is occasionally found in samples, its incidence is generally related to mains disturbance and re-samples are always satisfactory. It is not expected to result in a significant increase in exceedences.





*Stuart Derwent, MD and Michael Rouse, Chief Inspector of the Drinking Water Inspectorate, toast the successful completion of an £11 million improvement scheme.*

#### 4. Other Quality Issues

##### Cryptosporidium

**During 2002 a total of 4059 samples were taken from the 11 works classed as at 'significant risk' under the Cryptosporidium Regulations. Of these, 116 samples had low levels cryptosporidium detected, often only one cryptosporidium oocyst in a 1000 litre sample volume. All results were well below the treatment standard and there were no associated outbreaks of Cryptosporidiosis.**

The Cryptosporidium Regulations came into force from June 1999. They specified a new sampling procedure requiring continuous 24-hour sampling and the samples themselves to be treated in the same way as forensic evidence. A new more sensitive analysis method was specified which significantly improved the ability to detect the organism in water. A treatment standard of an average of less than one cryptosporidium oocyst in ten litres was also introduced.

##### Water Supply (Water Fittings) Regulations 1999

These Regulations replace the Bylaws previously issued by water companies. Their prime function is to protect the quality of water supply. All non-domestic premises must be categorised according to risk. A programme of inspections is being carried out by Southern Water to ensure that there is no risk of contamination by back siphonage due to illegal or incorrect installations.

##### Water Supply (Water Quality) Regulations 2000

These Regulations were introduced at the end of 2000 as a replacement for the existing Water Supply (Water Quality) Regulations 1989, and subsequent Amendments, and reflect the changes made within the EU Directive for water quality monitoring. The requirements of the Regulations are to be introduced over a phased period. From January 2001 water companies started monitoring for new parameters given in the Regulations. This enables the Drinking Water Inspectorate to assess compliance in advance of the standards. Within

Southern Water work is already underway to reduce lead levels in water and this is detailed in the section of this report on lead. The next deadlines are as follows:

- June 2003: Water companies to define sampling programmes and water quality zones.
- December 2003: New standards come into force.
- January 2004: Monitoring against new standards starts.

#### 5. Relaxations and Undertakings

No authorisations apply for relaxation of standards during 2002 in the Southern Water region.

Three undertakings were in force during 2002, refer to appendix 1 for details.

#### 6. Inspection of Records

A record of all compliance samples taken since 1 January 1990 is available for inspection by any member of the public during normal business hours.

Requests for information on water quality should be directed, preferably by telephone, to the Customer Service Centre (address at the back of this report). This information will be made available, free of charge, for the zone in which the customer resides. The water quality Public Register is available for inspection free of charge at our offices in Southern House, Yeoman Road, Worthing, during our normal business hours of 8am to 7pm Monday to Friday. For more information call 0845 278 0845.

If anyone wishes to inspect the Public Register, it will greatly assist the staff of Southern Water, and save time for the visitor, if a prior appointment is made through the Customer Service Centre at Worthing.

It is possible to view the register at other locations but only with a prior appointment.

TABLE 1

**Microbiological quality***Water leaving treatment works 01/01/02 - 31/12/02*

Volume of water distributed from works (m <sup>3</sup> /d)	No. of Samples	Percentage of samples exceeding PCV	
		Total Coliforms	Faecal Coliforms
less than 3,000	2221	0.18	0
3,000 - 12,000	3229	0.00	0
more than 12,000	1917	0.00	0
<b>TOTAL</b>	<b>7367</b>	<b>0.05</b>	<b>0</b>

Prescribed concentration or value (PCV): Total Coliforms = 0/100ml  
Faecal Coliforms = 0/100ml

TABLE 2

**Microbiological quality***Water in service reservoirs 01/01/02 - 31/12/02*

Capacity of reservoir (m <sup>3</sup> )	No. of Samples	Percentage of samples exceeding PCV	
		Total Coliforms	Faecal Coliforms
less than 3,000	5828	0.21	0.03
3,000 - 12,000	4138	0.12	0.05
more than 12,000	832	0.12	0
<b>TOTAL</b>	<b>10798</b>	<b>0.17</b>	<b>0.04</b>

Prescribed concentration or value (PCV): Total Coliforms = 0/100ml for 95% of samples taken from any service reservoir  
Faecal Coliforms = 0/100ml

TABLE 3

**Microbiological quality***Water at customers' taps 01/01/02 - 31/12/02*

Size of zone (population)		Less than 5,000	5,000 - 20,000	20,001 - 50,000	TOTAL
Type of sample					
Random	No. of samples	337	1488	4530	6355
	% exceeding PCV for Total Coliforms	0.59	0.07	0.24	0.22
	% exceeding PCV for Faecal Coliforms	0	0	0.02	0.02
Fixed	No. of samples	0	0	0	0
	% exceeding PCV for Total Coliforms	0	0	0	0
	% exceeding PCV for Faecal Coliforms	0	0	0	0
Totals	No. of samples	337	1488	4530	6355
	% exceeding PCV for Total Coliforms	0.59	0.07	0.24	0.22
	% exceeding PCV for Faecal Coliforms	0	0	0.02	0.02

Prescribed concentration or value (PCV): Total Coliforms = 0/100ml  
Faecal Coliforms = 0/100ml

If 50 or more samples have been taken in the preceding 12 months in a zone, 95% of samples must not contain total coliforms.

If less than 50 samples have been taken in the preceding 12 months in a zone, 48 of the last 50 samples taken must not contain total coliforms.

TABLE 4

**Physico-Chemical quality of water at customers' taps***Parameters which contravened the PCV 01/01/00 - 31/12/00*

Parameters	Size of zone (population)	No. of zones in size group	No. of samples	Percentage exceeding PCV	No. of samples in preceding column which satisfy the terms of a Relaxation	No. of zones in which PCV contravened	No. of zones in preceding column in which action taken has remedied the contravention (*)
<b>TOTAL TRIHALOMETHANES</b>	<5000	28	120	0	N/A	0	0
	5000 - 20000	38	173	2.9	N/A	2	0
	20001 - 50000	50	237	0.8	N/A	1	0
	<b>TOTAL</b>	<b>116</b>	<b>530</b>	<b>1.32</b>	<b>N/A</b>	<b>3</b>	<b>0</b>
<b>TOTAL TRIHALOMETHANES AVERAGE</b>	<5000	28	120	0	N/A	0	0
	5000 - 20000	38	173	2.9	N/A	2	0
	20001 - 50000	50	237	0.4	N/A	1	0
	<b>TOTAL</b>	<b>116</b>	<b>530</b>	<b>1.13</b>	<b>N/A</b>	<b>3</b>	<b>0</b>
<b>LEAD</b>	<5000	28	121	1.7	N/A	2	1
	5000 - 20000	38	162	0	N/A	0	0
	20001 - 50000	50	234	0.4	N/A	1	0
	<b>TOTAL</b>	<b>116</b>	<b>517</b>	<b>0.58</b>	<b>N/A</b>	<b>3</b>	<b>1</b>
<b>TOTAL PAH</b>	<5000	28	145	10.3	N/A	7	0
	5000 - 20000	38	177	6.8	N/A	6	0
	20001 - 50000	50	241	2.9	N/A	6	0
	<b>TOTAL</b>	<b>116</b>	<b>563</b>	<b>6.04</b>	<b>N/A</b>	<b>19</b>	<b>0</b>
<b>TOTAL</b>	<5000	28	---	---	---	9	1
	5000 - 20000	38	---	---	---	8	0
	20001 - 50000	50	---	---	---	8	0
	<b>TOTAL</b>	<b>116</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>25**</b>	<b>1</b>

NOTE (\*) - Zones have been included in this column only where a specific programme of remedial works has been completed. In many cases, the immediate action taken following the exceedence of the PCV, or other interim improvements, has reduced the risk of a further contravention. In some cases, the investigation following a contravention did not reveal an underlying cause, or the circumstances leading to the contravention are thought to be unlikely to recur.

\*\* Zones with more than one failing parameter are only counted once in the last section in the above table.

**This report is published in accordance with Regulation 31 of the Water Supply (Water Quality) Regulations 1989 as amended. It contains information prescribed in the Regulations and sets out the achievements of the Company against the standards.**

## APPENDIX 1

### Southern Water

#### Relaxations and Undertakings

During 2002 the Company had no current authorisations for relaxations.

During 2002 Southern Water had three Section 19 undertakings for three water quality parameters.

#### Undertakings Applicable During 2002

Parameter	Location	Action Taken	Completion Date
Lead	Steyning WSW	Optimisation of the plumbosolvency treatment installed at Steyning WSW, in line with the Undertaking, was completed in 2002.	December 2002
THMs	Brede WSW	Operational improvements have been made and investigations were completed during 2002 as a first step in a major capital scheme to refurbish the works.	December 2003
Nitrate	Gore WSW	Monitoring of the concentration of nitrate at Gore WSW and the WSZ supplied by Gore was started. The results of this monitoring are to be analysed in May 03. At this point a decision will be made as to any further action required.	31 March 2005

WSZ = water supply zone

WSW = water supply works



If you would like any further  
information please contact:

**Customer Service Centre**

Southern Water

PO Box 41

Worthing

BN13 3NZ

Telephone:

**0845 278 0845**

Minicom:

**0845 275 0845**

[www.southernwater.co.uk](http://www.southernwater.co.uk)

