



Water company performance

Part 3

Drinking Water in England 2004

Part 3

Water Company Performance

- This section is for the technical reader and presents detailed summaries of the results of the monitoring of drinking water quality carried out by each of the 25 water companies supplying consumers in England in 2004.
- Also included here is other relevant company performance information on:
 - overall compliance with drinking water standards;
 - events and incidents affecting drinking water quality;
 - consumer contacts about drinking water quality; and
 - water company operational performance measures.
- Where it is felt that a comparison across the industry as whole is informative, details for all 26 companies in England and Wales have been included.

There are 26 water companies supplying water in England and Wales. For a full listing and map of their areas of supply see figure 3.11. It can be seen from the map that some companies supply water across the national boundary between England and Wales.

Some companies supply water wholly to consumers in England, other companies supply water to consumers in both England and Wales. In this section of the report, unlike the regional summaries in Part 1, the data are presented by company and not apportioned according to national boundaries.

Compliance with drinking water standards

As required by the Water Undertakers (Information) Direction 2004 water companies have provided the Inspectorate with the results of all tests carried out by them for the purpose of demonstrating compliance with drinking water standards. The number of tests that companies carry out is set down in the regulations and is risk-based, being calculated according to either the population served by a zone or the volume of water supplied by a treatment works. In 2004 the total number of tests carried out to meet European and National standards by all water companies in England and Wales was 2,037,601 compared to 2,896,252 tests carried out in 2003, the last year of monitoring in accordance with the former (1989) regulations. This reduction

in the number of tests for compliance assessment purposes is a consequence of two aspects of the new regulations. Firstly companies can no longer multiply up a single result of a sample from a supply point by the number of zones served by that supply point (in England the stopping of this practice accounts for 10% of the reduction in the number of tests reported). Secondly compliance no longer includes tests carried out at works and reservoirs, likewise indicator parameters do not form part of compliance assessment (this change accounts for a 20% reduction in the number of compliance tests reported for all the 26 companies in England and Wales).

The information given in the drinking water quality data tables at the end of this part of the report indicates the extent to which the company has, or has not, met each of the drinking water standards in force with effect from 25 December 2003.

These company tables should not be used simplistically to compare the overall quality of the drinking water between different company areas. Drinking water quality varies naturally within and between company areas and depends, not only on the treatment processes employed and the condition of the distribution system, but also on the nature of the source from which the water is obtained. For example, water from a borehole in a chalk aquifer would normally be of a higher microbiological quality than water abstracted from lowland rivers. In addition, it should be noted that for all parameters, the number of tests carried out by each company differs (because of differences in population served and volume of water supplied) and, the greater the number of tests, the more likely it is that a breach of a standard will occur. This is not to say that meaningful comparisons of water company performance cannot be made. The Inspectorate has taken guidance from an independent statistician on the most appropriate method of assessing (and thus comparing) water company performance based on compliance with drinking water standards. This measure of compliance is known as mean zonal compliance %. Details of the methodology used to calculate this measure are given in Annex 3.

Table 3.1 shows the mean zonal compliance %. Overall for England compliance with the drinking water standards was very high (99.94%) in 2004, the first year of the new regulations. This sets the benchmark for companies to improve upon in future. It also demonstrates the degree of improvement in drinking water quality that is yet to be delivered by companies through the agreed programmes of work (described in Part 5 of the report) in the period 2005–2010.

Table 3.1: Mean zonal compliance % by company

Company	Mean zonal compliance %	Number of zones
England		
Folkestone and Dover Water Service Ltd	100.00	6
South Staffordshire Water Plc	100.00	223
Tendring Hundred Water Services Ltd	100.00	4
Mid Kent Water Plc	99.99	16
Yorkshire Water Services Ltd	99.97	78
Severn Trent Water Ltd	99.96	191
Thames Water Utilities	99.96	244
Three Valleys Plc	99.96	70
Anglian Water Services Limited	99.95	162
Essex and Suffolk Water Plc	99.94	51
Northumbrian Water Limited	99.94	79
Wessex Water Services Limited	99.94	103
Southern Water Ltd	99.93	83
Bristol Water Plc	99.92	52
United Utilities Water Plc	99.92	271
Bournemouth and West Hampshire Water Plc	99.91	10
South West Water Limited	99.91	23
Portsmouth Water Plc	99.90	13
Sutton and East Surrey Plc	99.89	19
South East Water Plc	99.87	75
Hartlepool Water Plc	99.82	3
Cholderton and District Water Company Ltd	99.79	1
Cambridge Water Company	99.76	8
Company	Mean zonal compliance %	Number of zones
Wales		
Dŵr Cymru Welsh Water	99.96	92
Dee Valley Water Plc	99.93	18
Albion Water Ltd	99.72	1
Country compliance		
Overall compliance for England	99.94	
Overall compliance for Wales	99.92	
Overall compliance for England and Wales combined	99.94	
Refer to Annex 3 for method of calculation of mean zonal compliance % for companies and countries.		

Events and incidents affecting drinking water quality

The Water Undertakers (Information) Direction 2004 requires water companies to inform the Inspectorate of all events that have affected, or are likely to affect drinking water quality, or sufficiency of supplies and, where as a result, there may be a risk to consumers' health.

Companies are required to notify the Inspectorate as soon as possible of any events which, in their opinion, meet the criteria set down in the Information Direction. In 2004, after consultation with the water industry, the Inspectorate updated its guidance to water companies on these criteria in the Inspectorate's Information Letter 12/2004 titled "Guidance on implementation of paragraph 7(1) of the Water Undertakers (Information) Direction 2004" (available on Inspectorate's website). In this guidance companies are encouraged to also notify the Inspectorate of events that may fall outside of the criteria but which nonetheless could impact on water quality or cause concern to consumers.

Assessment of events and incidents by the Inspectorate

When notified, Inspectors assess the water company's provisional information to determine whether the event is an incident. If the event is deemed to be an incident a full report from the company may also be required. The Inspector assesses all the information available to determine:

- what caused the problem and whether or not it was avoidable;
- what the company did in response and how it handled the incident;
- what lessons can be learned to prevent similar incidents in the future;
- if there were any breaches of enforceable regulations; and
- whether the company supplied water that was unfit for human consumption.

There are several typical outcomes of an incident assessment by an Inspector, these are set out below:

- A letter sent to the company, copied to other relevant parties;
- A letter sent to the company, copied to other relevant parties, making recommendations for action which the company must take to address deficiencies revealed by the incident;
- Enforcement action initiated against the company: a legal process to ensure the company takes all the necessary action to prevent further breaches of either a regulatory duty or a drinking water standard; other relevant parties are informed; and
- Initiation of prosecution proceedings against the company or the issue of a formal caution for a criminal offence; other relevant parties are informed.

More detail on the assessment process, including a flow diagram which illustrates the process and timescale in which events and incidents are managed by water companies and the Inspectorate respectively, is available on the Inspectorate's website.

Details of notified events and incident assessments during 2004

Brief descriptions of all incidents which occurred in 2004 are given in Table 3.5. Those incidents that the Inspectorate feels are of particular interest to consumers and local authorities are mentioned in the relevant regional section in Part 1 of this report. As a general principle, incidents highlighted in regional reports are those which are either typical of an event type that occurs quite often or they serve to illustrate a specific point of learning for all water companies. It is a new feature of our report this year that we are publishing details of all incidents together with the learning points, in response to frequent requests from local authorities and others to do so.

Table 3.2 summarises the events and incidents notified in 2004 and their assessment status on 31 December 2004. This includes only those events which occurred in 2004. Across England and Wales a total of 89 incidents which potentially affected 3.2 million consumers were notified in 2004. This compares to 99 incidents affecting 2.3 million consumers in 2003. Also in 2004 there were 215 notifications that were classified as non-incidents which compares to 254 non-incidents in 2003.

At the end of 2004 a total of 63 assessments were outstanding (61 from 2004 and 2 from earlier years).

Table 3.2 Events and incidents notified in 2004 and outcome as at 31 December 2004 for all 26 companies.

Incidents notified in 2004:	89
Non-Incidents notified in 2004:	215
Total number of events in 2004	304
2004 events assessed:	244
No action required:	207
Recommendations:	36
Enforcement Action:	1
Caution:	0
Prosecutions:	0
Pre- 2004 events assessed in 2004:	63
No action required:	41
Recommendations:	20
Enforcement Action:	0
Prosecutions:	1
Caution	1
Total number of assessments completed in 2004	306

Table 3.2 Events and incidents notified in 2004 and outcome as at 31 December 2004 for all 26 companies (continued)

2004 assessments outstanding:	61
Pre-2004 assessments outstanding:	2
Total number of assessments outstanding	63
Note: the reporting period for completion of incident assessment is 1 January to 31 December.	

Companies prosecuted or cautioned for supplying water unfit for human consumption

There was one prosecution of a water company in the 2004 reporting period and the Inspectorate also issued one formal caution. The prosecution of Anglian Water took place in March 2004 for an incident arising in April 2002. The company admitted the offence of supplying water unfit for human consumption (taste and odour). Full details are provided in Part 1 – Eastern Region.

A caution was issued in September 2004 to Three Valleys Water following loss of supplies from Therfield Water Tower. The company admitted supplying water unfit for human consumption (discoloured water) in February 2003. Full details are provided in Part 1 – Thames Region.

Table 3.3 gives the number of prosecutions and cautions, across England and Wales, the investigation of which were concluded between 2000 and 2004. It also shows the number of cases pending before the courts and the number of incidents that were still under consideration as at 31 December 2004. In studying the table it is important to take into account the following:

- The number of incidents occurring can be expected to be approximately proportional to the size of the water company, and particularly the length of the distribution system;
- Companies with no incidents in the categories specified are not included in the table;
- Many are minor incidents affecting only a few consumers;
- Many of the incidents occur for reasons outside the control of water companies e.g. a burst main; and
- Prosecution cases can take at least a year to get to court so they do not necessarily reflect the position today.

Incident Learning

Incidents will always happen therefore it is important that companies have in place arrangements and procedures for minimising their impact on consumers and efficiently restoring supplies to normal.

Table 3.4 shows the frequency of incidents between 1997 and 2004 for each company expressed as a ratio of the length of their distribution system. From this it can be seen that on average (and taking all companies together) there was one incident for every 3,330km of main during 2004. In the worst case there was one incident for every 1,428km of main (Northumbrian Water).

A common fault of companies when managing incidents relates to their arrangements for sampling and testing water supplies. Companies need to take timely samples from appropriate locations and the tests done on these samples need to be relevant to the circumstances and the risk. The Inspectorate will be looking to see that companies make significant improvements in this aspect of their incident responses in 2005. Other common factors that caused or aggravated a number of incidents were: alarm monitoring and responses, the status and operation of valves and the staff competence and knowledge. These findings will inform the Inspectorate's risk-based programme of technical audit going forward.

Table 3.3: Water company incidents and prosecutions 2001 – 2004

Water company	Population supplied	Length of Mains (km)	No of incidents notified in year				Prosecutions (Cautions) completed in year				Cases pending before court at 31/12/03	Incidents still under investigation as at 31/12/04 ([+] – pre-2003)
			2001	2002	2003	2004	2001	2002	2003	2004		
England												
Anglian	4,074,000	36,000	14	21	9	1	1	1	-	-	0	0
Bournemouth & West Hants	424,000	2,745	0	1	1	1	-	-	-	-	0	1
Bristol Water	1,052,000	6,553	1	2	5	3	-	-	-	-	0	1
Cambridge Water	290,900	2,262	3	1	0	0	-	-	-	-	0	0
Essex & Suffolk	1,738,700	8,613	1	3	4	4	-	-	-	-	0	0
Folkestone & Dover	157,900	1,084	2	0	0	0	-	-	-	-	0	0
Hartlepool	88,600	582	0	1	0	0	-	-	-	-	0	0
Mid Kent	579,300	4,209	2	0	0	0	1(1)	-	-	-	0	0
Northumbrian	2,441,000	16,930	21	14	10	12	-	-	-	-	0	4
Portsmouth	664,600	3,236	2	0	0	1	-	-	-	-	0	1
Severn Trent	7,280,000	45,783	5	2	6	3	-	-	-	-	0	2
South East	1,442,000	9,684	1	1	1	2	-	-	-	-	0	2
South Staffs	1,233,000	5,901	2	5	2	1	-	-	-	-	0	1
South West	1,500,000	15,000	4	5	1	1	-	-	-	-	0	0
Southern	2,295,000	13,410	7	9	4	4	-	-	-	-	0	3

Table 3.3: Water company incidents and prosecutions 2001 – 2004 (continued)

Water company	Population supplied	Length of Mains (km)	No of incidents notified in year					Prosecutions (Cautions) completed in year					Cases pending before court at 31/12/03	Incidents still under investigation as at 31/12/04 ([+] – pre-2003)
			2001	2002	2003	2004	2001	2002	2003	2004				
Sutton & East Surrey	642,000	3,390	2	1	1	2	-	-	-	-	0	1		
Tendring Hundred	147,700	907	2	0	0	0	-	-	-	-	0	0		
Thames	8,085,000	31,416	7	7	7	3	-	-	-	-	0	3		
Three Valleys	2,940,000	14,000	11	6	5	4	-	-	(1)	-	0	1(1)		
United Utilities	6,950,000	40,000	18	9	15	15	-	-	-	-	0	7(1)		
Wessex	1,181,000	10,500	5	2	2	3	-	-	-	-	0	1		
Yorkshire	4,700,000	31,062	12	10	15	18	1(4)	(1)	-	-	0	10		
Total for England	49,906,700	303,267	122	100	88	78	3(5)	(1)	-	1(1)	0	38 (2)		
Wales														
			2001	2002	2003	2004	2001	2002	2003	2004				
Dee Valley Water	262,630	1,976	1	0	0	0	-	-	-	-	0	0	0	
Dŵr Cymru Welsh Water	2,903,000	22,565	15	12	11	11	1	-	(1)	-	0	4	4	
Total for Wales	3,162,630	24,541	16	12	11	11	1	-	(1)	-	0	4	4	
Albion had no incidents in this period.														
Total for all companies	53,069,330	327,808	138	112	99	89	4 (5)	(1)	(1)	1 (1)	0	42 (2)	42 (2)	

Table 3.4: Number of incidents per 1000 Km of mains 1997-2004

Company	Length of Mains in 2004 (km)	Number of incidents per 1,000 km mains								
		1997	1998	1999	2000	2001	2002	2003	2004	
England										
Northumbrian	16,930	0.8	0.8	0.7	0.6	1.2	0.8	0.6	0.7	
Yorkshire	31,062	0.5	0.5	0.9	0.5	0.4	0.3	0.5	0.6	
Sutton & East Surrey	3,390	0.6	0.3	0.6	0.0	0.6	0.3	0.3	0.6	
Essex & Suffolk	8,613	0.5	0.2	0.6	0.5	0.1	0.3	0.5	0.5	
Bristol Water	6,553	-	-	-	-	0.2	0.3	0.8	0.5	
United Utilities	40,000	0.3	0.9	0.7	0.4	0.5	0.2	0.4	0.4	
Bournemouth and W Hants	2,745	-	0.4	-	-	-	0.4	0.4	0.4	
Portsmouth	3,236	0.3	0.3	1.2	0.3	0.6	-	-	0.3	
Southern	13,410	0.1	0.1	0.1	0.2	0.5	0.7	0.3	0.3	
Three Valleys	14,000	0.1	0.1	0.7	0.6	0.8	0.4	0.4	0.3	
Wessex	10,500	0.4	0.3	0.4	0.4	0.5	0.2	0.2	0.3	
South East	9,684	0.3	0.3	0.4	0.7	0.1	0.1	0.1	0.2	
South Staffs	5,901	0.3	-	0.2	0.5	0.3	0.8	0.3	0.2	
Thames	31,416	0.1	0.3	0.4	0.2	0.2	0.2	0.2	0.1	
South West	15,000	0.5	0.2	0.3	0.5	0.3	0.3	0.1	0.1	
Severn Trent	45,783	0.1	0.2	0.4	0.4	0.1	0.0	0.1	0.1	
Anglian	36,000	0.3	0.4	0.4	0.5	0.4	0.6	0.3	<0.03	
Cambridge Water	2,262	-	-	-	-	1.3	0.4	-	-	

Table 3.4: Number of incidents per 1000 Km of mains 1997-2004 (continued)

Company	Length of Mains in 2004 (km)	Number of incidents per 1,000 km mains								
		1997	1998	1999	2000	2001	2002	2003	2004	
Cholderton & District	44	-	-	-	-	-	-	-	-	
Folkestone & Dover	1,084	-	-	-	1.8	1.8	-	-	-	
Hartlepool	582	-	-	-	1.7	-	1.7	-	-	
Mid Kent	4,209	-	0.5	1.0	-	0.5	-	-	-	
Tendring	907	1.1	1.1	1.1	-	2.2	-	-	-	
For England	303,311	0.3	0.4	0.5	0.4	0.4	0.3	0.3	0.3	
Wales										
Albion	0	-	-	-	-	-	-	-	-	
Dŵr Cymru Welsh Water	22,565	0.6	0.4	0.4	0.5	0.7	0.5	0.5	0.5	
Dee Valley	1,976	0.5	0.5	0.5	-	0.5	-	-	-	
For Wales	24,541	0.6	0.4	0.4	0.4	0.7	0.5	0.4	0.4	
For 26 water companies	327,852	0.3	0.4	0.5	0.4	0.4	0.3	0.3	0.3	

Table 3.5: Summary details of water quality incidents that occurred in 2004

Date of start of incident (2004)	Area(s) affected	Nature and cause of incident	Estimate of population affected and duration of incident	Main findings of the Inspectorate's investigation
England				
Anglian Water				
24 November	Bury St Edmunds	Microbiological contamination after a mains burst	5 for three days	Recommended that the Company ensures samples are taken from appropriate downstream locations following a mains repair.
Bournemouth & West Hampshire Water				
8 November	Fawley	Plant failure affecting disinfection system. No consumers affected. Duration of incident one hour	Recommended that the Company: (i) should thoroughly and regularly test the back up electrical circuit; (ii) implement	a process for checking actions have been carried out; and (iii) amends its procedures for notification.
Bristol Water				
5 August	Webbs Heath	Discolouration following a mains burst	60,000 for two days	No additional comments
16 August	Sherston, Marshfield, Picklechurch and Wick	Microbiological contamination. Cause not found.	18,900 for four days	No additional comments
7 October	Clevedon	Discolouration following planned work	9,200 for two days	Recommended that the Company: (i) records direction of valve closure for each valve; (ii) reviews alarm settings and interpretations; and (iii) gives refresher training to operators on reverse valve operation.

Table 3.5: Summary details of water quality incidents that occurred in 2004 (continued)

Date of start of incident (2004)	Area(s) affected	Nature and cause of incident	Estimate of population affected and duration of incident	Main findings of the Inspectorate's investigation
England				
Essex and Suffolk Water				
13 June	Chigwell works	Plant failure affecting disinfection system	Works supplies 1,140,000 but nobody affected as only partial chlorination failure.	No additional comments.
30 June	Romford	Loss of supplies following a mains burst and issue of advice to boil water	250 for three days	No additional comments.
17 September	Linford, Essex	Discolouration following planned work	460 for four hours	An unacceptable delay in informing the Inspectorate.
28 November	Writtle, Essex	Precautionary issue of advice to boil water	1,000 for 24 hours	A problem with a ball valve at a service reservoir disrupted supplies.
Northumbrian Water				
3 February	Houghton-le-Spring	Discolouration following planned work	22,600 for three days	Control room took no action when alarm was triggered; recommended that all staff are made aware of required response to alarms during planned work. Inadequate risk assessment prior to work; recommended that arrangements for commissioning plant and equipment are reviewed.

Table 3.5: Summary details of water quality incidents that occurred in 2004 (continued)

Date of start of incident (2004)	Area(s) affected	Nature and cause of incident	Estimate of population affected and duration of incident	Main findings of the Inspectorate's investigation
England				
Northumbrian Water				
10 March	Belmont, Co Durham	Discolouration following planned work	3,500 for two days	Recommended that staff follow sampling procedures as sampling was not timely enough.
5 April	Otterburn works	Plant failure and issue of advice to boil water	540 for two days	Treatment sludge entered the final water tank during tankering operations and there was a delayed response to alarms. Recommended that the following are reviewed: (i) procedures for accessing treated water; (ii) procedures for control of access to secure areas; and (iii) configuration of water quality alarms.
20 April	Gunnerton works	Disinfection system failure, reduced chlorine residual	33,200 for three days	Site relied on remote callout overnight when there was no automatic shutdown facility. Inadequate communication caused a delay in response.
24 April	Otterburn works	Plant failure, loss of telemetry communications and issue of advice to boil water	370 for three days	There was a delay in shutting down the treatment works. Recommended that arrangements for responding to loss of telemetry are reviewed.
6 June	Cramlington and Blyth	Discolouration through valve operation	67,500 for three days	Recommended that the risks associated with the operation of this valve are assessed and arrangements to minimise potential for a recurrence of the incident be introduced.

Table 3.5: Summary details of water quality incidents that occurred in 2004 (continued)

Date of start of incident (2004)	Area(s) affected	Nature and cause of incident	Estimate of population affected and duration of incident	Main findings of the Inspectorate's investigation
England				
Northumbrian Water				
13 June	Darras Hall, Ponteland	Discolouration caused by unusually high demand for water	4,500 for two days	No additional comments.
18 July	Killingworth	Discolouration following planned work	5,000 for 24 hours	No additional comments.
25 July	Killingworth	Discolouration caused by high demand by an industrial user	73,000 for three days	Suggested a review of arrangements with other large water users and consideration of alternative methods for identifying unusually high flows.
7 August	Whalton Village	Issue of advice to boil water after detection of microbiological contamination in distribution	200 for three days	Comments on inappropriate sampling locations and inadequate follow up action.
8 October	Prudhoe area	Discolouration following planned work	5,300 for three days	Recommended that the Company reviews its instructions to contractors on the use of hydrants and standpipes.
21 October	Lemington Hall, Edlingham	Issue of advice to boil water following a mains burst	22 for 21 days	Investigation on-going.

Table 3.5: Summary details of water quality incidents that occurred in 2004 (continued)

Date of start of incident (2004)	Area(s) affected	Nature and cause of incident	Estimate of population affected and duration of incident	Main findings of the Inspectorate's investigation
England				
Portsmouth Water				
14 June	Southsea	Discolouration following planned work	1,500 for seven hours	Investigation on-going.
Severn Trent Water				
29 January	Leek	Loss of supplies following plant failure	12,500 for two days	No additional comments.
1 October	Wolverhampton	Discolouration in bulk supply received from South Staffordshire Water	82,000 for two days	Investigation on-going.
25 October	Sugarbrook works	Detection of microbiological contamination	164,000 for 28 hours	Investigation on-going.

Table 3.5: Summary details of water quality incidents that occurred in 2004 (continued)

Date of start of incident (2004)	Area(s) affected	Nature and cause of incident	Estimate of population affected and duration of incident	Main findings of the Inspectorate's investigation
England				
South East Water				
21 January	Sweet Willow Wood works	High turbidity in treated water caused by plant failure. Possible microbiological contamination.	No consumers affected directly although problem persisted for two days.	The Company had inadequate procedures for dealing with this type of incident, undertook inadequate follow-up sampling, did not liaise with local authorities and health authorities and there was an unacceptable delay in notifying the Inspectorate. Enforcement action initiated, it was recommended that the Company: <ul style="list-style-type: none"> (i) urgently reviews its procedures for responding to treatment alarms; (ii) instigates a formal shift handover process to highlight on-going issues; (iii) replaces or re-configures a turbidity meter at this site and others of the same design in use elsewhere; (iv) reviews sampling procedures following a treatment failure; (v) takes formal advice from qualified public health specialists on health risks of microbiological failures; and (vi) undertakes a full review of operations management practice and ensures it is in line with industry best practice.
31 August	Barcombe, Deepdean, Friston and Holwell works	Failure to take a required sample for <i>Cryptosporidium</i>	Supply to 20,000 for 24 hours although no consumers affected directly.	Investigation on-going.

Table 3.5: Summary details of water quality incidents that occurred in 2004 (continued)

Date of start of incident (2004)	Area(s) affected	Nature and cause of incident	Estimate of population affected and duration of incident	Main findings of the Inspectorate's investigation
England				
South Staffordshire Water				
2 November	Outwoods	Discolouration following planned work	19,000 for 15 hours	Investigation on-going.
Southern Water				
16 January	Brede works	Possibly supplied unwholesome water because of a deterioration in raw water quality	100,000 for 12 hours	There was inadequate follow-up sampling and staff training and competence.
25 January	Mile Oak works	Plant malfunction causing high chlorine in supply	19,700 for 24 hours	The Company removed a private reservoir from the mains supply but it did not keep customers informed or liaise with local authorities and health authorities.
17 May	Plucks Gutter works	Wholesomeness concern following loss of coagulation following a plant failure	No consumers affected directly as the works was shut down	The Company allowed important and vital parts of its operating procedures to be ignored and there was inadequate training and competence of staff. Recommended that the Company: (i) ensures that its procedures are followed fully; (ii) trains operators specifically for this site; and (iii) provides documentary evidence to show that appropriate procedures for shutting down water treatment works are in place.

Table 3.5: Summary details of water quality incidents that occurred in 2004 (continued)

Date of start of incident (2004)	Area(s) affected	Nature and cause of incident	Estimate of population affected and duration of incident	Main findings of the Inspectorate's investigation
England				
Southern Water				
24 May	Luccombe service reservoir, Isle of Wight	Wholesomeness concern following structural failure at a service reservoir	150 for three days	The Company did not have records to show its structural inspection of the reservoir. Recommended that the Company surveys the reservoir internally at least once every 15 years.
South West Water				
10 June	Sheffield, Penzance	Issue of advice to boil water following detection of microbiological contamination in distribution	115 for 13 days	Recommended that the Company considers arrangements for earlier transportation of samples to the laboratory.
Sutton and East Surrey Water				
6 June	Great Bookham	Issue of advice to boil water following detection of microbiological contamination in distribution	20 for two days	No additional comments.
9 December	Lingfield	High pH and taste and odour following mains rehabilitation	10 for 24 hours	Recommended that the Company improve its procedures for notifying local and health authorities and the Inspectorate.

Table 3.5: Summary details of water quality incidents that occurred in 2004 (continued)

Date of start of incident (2004)	Area(s) affected	Nature and cause of incident	Estimate of population affected and duration of incident	Main findings of the Inspectorate's investigation
England				
Thames Water				
23 January	Swindon	Discolouration following planned work	7,300 for 24 hours	Sampling was not timely enough and there were inadequate trigger values. Valve status not checked adequately. Inadequate number of samples were taken. Better liaison required between samplers and network.
15 May	Spencers Wood, Burghfield and Tadley	Discolouration following planned work	145,000 for 30 hours	Investigation on-going.
17 September	Seven Sisters Road, London N4	Microbiological contamination following a mains burst	11,600 for seven days	The Company inadequately investigated the root cause. Recommended that the Company: (i) reviews procedures for investigating the cause and instigating corrective action during microbiological events; (ii) ensures that a representative number of samples from consumers' taps are taken during an event; and (iii) informs the Inspectorate and other authorities of all events that may represent a risk to the health of consumers

Table 3.5: Summary details of water quality incidents that occurred in 2004 (continued)

Date of start of incident (2004)	Area(s) affected	Nature and cause of incident	Estimate of population affected and duration of incident	Main findings of the Inspectorate's investigation
England				
Three Valleys Water				
13 January	Maple Cross	Discolouration following planned work	2,200 for five hours	Recommended that the Company improves sampling procedures. Inconsistent advice to consumers. Weaknesses in the risk assessment prior to commencement of work
4 May	Staines	Wholesomeness concern following mains burst	15 for four days	No additional comments.
18 May	Egham works	Reduction in chlorine dosing following plant failure	625,000 for 24 hours	No additional comments.
25 October	Hempstead, Essex	Detection of microbiological contamination in distribution	20 for seven days	Investigation on-going.
United Utilities				
5 January	Ashtons Green, St Helens	Discolouration following planned work	3,600 for 24 hours	Valve status was unchecked prior to commencing work. Recommended that the Company must: (i) undertake more timely sampling; and (i) take resamples from properties where samples exceeded standards.
6 January	Quarry Hill works	Discolouration following a plant failure	20,500 for three days	There was an inadequate number of follow-up samples taken. Recommended that the Company: (i) undertakes more timely and comprehensive sampling; and (ii) take resamples from properties where samples exceeded standards.

Table 3.5: Summary details of water quality incidents that occurred in 2004 (continued)

Date of start of incident (2004)	Area(s) affected	Nature and cause of incident	Estimate of population affected and duration of incident	Main findings of the Inspectorate's investigation
8 January	Anfield	Discolouration following planned work	17,000 for three days	An inadequate number of samples taken.
3 February	Poaka Beck works	High pH levels following plant failure	28,500 for 12 hours	There was inadequate communication which caused a delay in response. Recommended that the Company: (i) reviews its arrangements for responding to alarms; and (ii) ensures its sampling programme accurately reflects the event.
16 March	Blackpool	Discolouration following planned work	5,000 for two days	Recommended that the Company advises the Inspectorate of specific revisions to its procedures.
19 March	Thornton and Cleveleys	Discolouration following planned work	21,000 for 24 hours	Recommended that the Company includes full details of its investigations and conclusions in its report to the Inspectorate. Inadequate sampling procedures.
18 May	Merseyside	Discolouration following planned work	673,000 for seven days	Investigation on-going.
14 July	Glossop	Discolouration following planned work	6,700 for 24 hours	Recommended that the Company follows its procedures for initial and follow-up sampling.

Table 3.5: Summary details of water quality incidents that occurred in 2004 (continued)

Date of start of incident (2004)	Area(s) affected	Nature and cause of incident	Estimate of population affected and duration of incident	Main findings of the Inspectorate's investigation
England				
United Utilities				
24 July	Hug Bridge works	Loss of disinfection following plant failure	29,300 for 24 hours	Recommended that the Company: (i) makes chlorine vacuum failure and auto-shutdown generate telemetry alarms; (ii) prepares a method statement when part of a works is taken out of service; and (iii) undertakes audit of its monitoring system and puts in place measures to prevent a recurrence.
21 August	Trawden	Issue of advice to boil water following detection of microbiological contamination	2,500 for two days	Recommended that the Company: (i) reviews its shutdown procedures; (ii) takes an adequate number of samples; (iii) includes in its procedures written instructions for operation of manual over-ride to auto-shutdown and reducing the time delay for this operation; (iv) reinstates the strainer or generates a telemetry alarm for head-loss; (v) includes storage tanks in its flushing programme; (vi) reviews its procedures for distributing notices; (vii) advises the Inspectorate of all improvements made to its procedures; and (viii) adopts a water safety plan approach for operating this works.
21 August	Hayeswater	Detection of <i>Cryptosporidium</i> in treated water	6,200 for three days	Investigation on-going.

Table 3.5: Summary details of water quality incidents that occurred in 2004 (continued)

Date of start of incident (2004)	Area(s) affected	Nature and cause of incident	Estimate of population affected and duration of incident	Main findings of the Inspectorate's investigation
England				
United Utilities				
28 August	Great Sutton	Discolouration, cause unknown	6,300 for four days	Recommended that the Company: (i) in similar circumstances takes more samples to establish that water quality has returned to normal; and (ii) brings forward its mains flushing programme for this works.
9 September	Turton and Harwood, Bolton	Discolouration caused by excess pumping disturbing mains deposits	12,300 for four days	Investigation on-going.
4 October	Droylsden	Discolouration following planned work	25,000 for two days	Investigation on-going.
15 October	Neston	Discolouration following planned work	12,800 for three days	Investigation on-going.
Wessex Water				
20 February	Merriott	Discolouration following planned work	2,000 for 24 hours	Recommended that the Company considers warning consumers under similar future circumstances and suggested that wider contingency planning is not restricted to new mains connections.
16 April	Yetminster	Discolouration following hydrant use by third party	500 for 24 hours	Unclear advice given to a small number of consumers and recommended that issue of advice is reviewed and action taken to ensure alternative supplies are provided where promised.
2 July	Ramsey Old service reservoir, near Langford	Detection of microbiological contamination	78,000 for three days	No additional comments

Table 3.5: Summary details of water quality incidents that occurred in 2004 (continued)

Date of start of incident (2004)	Area(s) affected	Nature and cause of incident	Estimate of population affected and duration of incident	Main findings of the Inspectorate's investigation
England				
Yorkshire Water				
1 January	Graincliffe works	Elevated turbidity caused by power failure	10,000 for three days	<p>Sampling was not timely enough and not for appropriate parameters. There was an unacceptable delay in notifying local and health authorities and the Inspectorate.</p> <p>Recommended that the Company:</p> <ul style="list-style-type: none"> (i) undertakes more timely and comprehensive sampling; (ii) ensures emergency equipment is tested following any work on it; and (iii) revises its notification procedures. <p>It was noted that these recommendations were similar to those made in respect of an incident at this site in 2003.</p>
11 February	Harlow Moor, Harrogate	Discolouration following planned work	700 for seven hours	Investigation on-going
1 April	Skipton	Discolouration following a mains burst	7,500 for two days	<p>The Company assumed a valve was open when it was closed. There was inadequate investigation into the cause and initially it failed to consider flushing.</p> <p>Recommended that the Company:</p> <ul style="list-style-type: none"> (i) reviews its procedures for investigation and flushing; (ii) keeps records of valve status; and (ii) ensures it notifies incidents to WaterVoice.

Table 3.5: Summary details of water quality incidents that occurred in 2004 (continued)

Date of start of incident (2004)	Area(s) affected	Nature and cause of incident	Estimate of population affected and duration of incident	Main findings of the Inspectorate's investigation
England				
Yorkshire Water				
16 April	Fulwood, Sheffield	Taste and odour following a mains burst	4,000 for two days	Recommended that the Company ensures it notifies incidents to WaterVoice.
10 May	Allerton, Bradford	Issue of advice to boil water following detection of microbiological contamination	620 for seven days.	There was a delay in putting in place remedial action. Recommended that the Company: (i) reviews its procedures for instigating chlorination where contamination is suspected; and (ii) reviews the way it manages and supervises work carried out by contractors.
28 May	Osmotherley works	Loss of disinfection due to plant failure	17 for six hours	There was a delay in sending a technician to the works. Recommended that the Company: (i) revises its procedures for sending technicians to site; and (ii) reviews other works with similar controls.
29 May	Finningley works	Discolouration caused by problem with phosphate treatment	50,000 for three days	Failed to send a technician to check the dosing system, review on-line monitoring and establish the mains lining material. Recommended that the Company modifies its procedures accordingly.

Table 3.5: Summary details of water quality incidents that occurred in 2004 (continued)

Date of start of incident (2004)	Area(s) affected	Nature and cause of incident	Estimate of population affected and duration of incident	Main findings of the Inspectorate's investigation
England				
Yorkshire Water				
3 June	Baildon, Bradford	Issue of advice to boil water following detection of microbiological contamination	175 for four days	There were inadequacies in the response time, chlorination procedures and competence of staff.
14 June	Rossington	Discolouration caused by high demand and unplanned works shutdown	13,700 for three days	No additional comments.
29 July	Holm Bridge works	Discolouration caused by plant failure	87,500 for 24 hours	No additional comments.
30 July	Gawthorpe	Issue of advice to boil water following detection of microbiological contamination	Seven for six days	Did not fully investigate or consider corrective action early enough. Recommended that the Company: (i) investigates potential causes and considers corrective action on initial identification of indicator bacteria; and (ii) reviews its procedures for instigating chlorination when contamination is identified.
14 August	Chapel Allerton, Leeds	Issue of advice to boil water following damage to mains by a third party	25 for seven days	There was a slow response to finding that chlorination had not eliminated the problem. Recommended that the Company takes remedial action without delay when there is evidence of on-going contamination.

Table 3.5: Summary details of water quality incidents that occurred in 2004 (continued)

Date of start of incident (2004)	Area(s) affected	Nature and cause of incident	Estimate of population affected and duration of incident	Main findings of the Inspectorate's investigation
England				
Yorkshire Water				
21 August	Romany, near Northallerton	Discolouration, cause unknown	320 for four days	Investigation on-going.
15 September	York	Discolouration following planned work	5,000 for 12 hours	Did not predict potential discolouration following re-zoning of water supplies.
25 September	Chapel Allerton, Leeds	Discolouration following mains burst	41,400 for four days	No additional comments.
7 December	Harlow Hill works	Discolouration following plant dosing failure	100,000 for two days	Recommended that the Company review its trigger levels for alarms.
14 December	Dudley Hill	Discolouration following planned work	30,000 for ten hours	Investigation on-going.
8 December	Graincliffe works	Discolouration following plant failure	10,000 for two days	No additional comments.

Table 3.5: Summary details of water quality incidents that occurred in 2004 (continued)

Date of start of incident (2004)	Area(s) affected	Nature and cause of incident	Estimate of population affected and duration of incident	Main findings of the Inspectorate's investigation
Wales				
Dŵr Cymru Welsh Water				
18 January	Glascoed	Taste and odour caused by algae in the raw water	77,500 for 24 days	The Company did not anticipate the algal problem because of the time of year. An inadequate number of samples were taken, it appeared to have an inadequate programme for filter regeneration and there was an unacceptable delay in notifying health and local authorities and the Inspectorate. Recommended that the Company: (i) reviews its monitoring arrangements and risk assessments; (ii) reviews bypass arrangements; and (iii) reviews its sampling programme for taste and odour.
3 February	St Lythams service reservoir	Access cover damaged	12,600 for 24 hours	Sampling was not timely enough and did not notify local and health authorities. Recommended that the Company undertakes more timely sampling.
3 February	Cwellyn works	Elevated turbidity in treated water due to raw water deterioration	12,900 for three weeks	There was a delay in responding to and investigating a turbidity alarm. Recommended that the Company takes a more proactive approach to controlling turbidity at this site.

Table 3.5: Summary details of water quality incidents that occurred in 2004 (continued)

Date of start of incident (2004)	Area(s) affected	Nature and cause of incident	Estimate of population affected and duration of incident	Main findings of the Inspectorate's investigation
Wales				
Dŵr Cymru Welsh Water				
10 February	Llwynypia pumping station	Discolouration following pump failure	2,000 for 24 hours	Failed to attend site after the alarm was activated, had no arrangements to monitor the sufficiency of supply overnight and restarted pumping before checking water quality. Recommended that the Company: (i) reviews its procedures for responding to alarms and its arrangements for monitoring; and (ii) reviews its procedures to ensure that decisions are clearly communicated to staff.
15 March	Deeside	Discolouration following planned work	2,000 for three days	There was a delay in sampling affected food premises and an unacceptable delay in notifying the Inspectorate. Recommended that the Company improves its procedures for notifying the Inspectorate.
12 May	Abergavenny	Discolouration following planned work	100,000 for three days	Investigation on-going.
14 June	Swansea Valley	Discolouration following a mains burst	130,000 for seven days	Samples were not analysed for appropriate parameters.

Table 3.5: Summary details of water quality incidents that occurred in 2004 (continued)

Date of start of incident (2004)	Area(s) affected	Nature and cause of incident	Estimate of population affected and duration of incident	Main findings of the Inspectorate's investigation
Wales				
Dŵr Cymru Welsh Water				
19 August	Penybont works	Elevated colour due to raw water deterioration	5,600 for 12 days	There was inadequate risk assessment, sampling was not timely enough and there was an unacceptable delay in notifying health and local authorities and the Inspectorate. Recommended that the Company: (i) adopts a more proactive approach to similar future incidents; (ii) improves sampling records; (iii) adopts a drinking water safety plan risk assessment approach to operating the works; and (iv) improves details of contacts with local authorities.
31 August	Cwm Ciwc	Issue of advice to boil water following detection of microbiological contamination at a service reservoir	3,200 for five days	Recommended that the Company: (i) keeps the reservoir isolated until it is abandoned; (ii) follows The Inspectorate's recommended procedures for actions to be taken in the event of a microbiological failure at a service reservoir; and (iii) improves details of contacts with local authorities.
13 Sept	Ebbw Vale	Issue of advice to boil water following detection of microbiological contamination at a service reservoir	32,500 for three days	Investigation on-going.

Table 3.5: Summary details of water quality incidents that occurred in 2004 (continued)

Date of start of incident (2004)	Area(s) affected	Nature and cause of incident	Estimate of population affected and duration of incident	Main findings of the Inspectorate's investigation
Wales				
Dŵr Cymru Welsh Water				
4 November	Llandudno	Detection of microbiological contamination in distribution	13,300 for eight days	Investigation on-going.
<p>Note : there were no incidents in Wales for Severn Trent, Albion or Dee Valley. Three incidents in Severn Trent's area were in England.</p>				

Consumer Contacts about drinking water quality

The Water Undertakers (Information) Direction 2004 requires companies to tell the Inspectorate about the work that they do to inform consumers about drinking water quality. On request, all companies will send consumers a written summary of the results of tests on samples collected from the water supply zone where they live or work. Consumers can access more detailed information by visiting the company offices and inspecting the public register (a regulatory requirement) however companies report that few, if any, consumers take up this option.

The most common information requested by consumers is about the fluoride or the hardness content of their drinking water. In 2004 at least 21,000 consumers requested this information from their water company. Some companies make this type of information available to consumers directly on their websites but many consumers have to make a telephone call to the company. Some companies (for example, Severn Trent, Bournemouth & West Hampshire Water) have developed their websites further to allow consumers to enter a postcode and receive a water quality report for their water supply zone, this proactive approach is commendable use of new technology. Most companies have some form of drinking water quality information on their websites but the Inspectorate feels that much of this is “promotional” and “selective” rather than “informative” and “balanced” (the topic of communicating drinking water quality information to the consumers will be the subject of a Water UK/Inspectorate seminar for company practitioners in the near future).

When consumers are concerned about their drinking water quality their first point of contact is the water company, although some choose to go elsewhere, for example their local WaterVoice committee or the environmental health department of their local authority. The most usual form of contact is a telephone call but some consumers will write or e-mail. All water companies record these contacts in a broadly similar way and, this year, for the first time, companies have provided a summary of this information to the Inspectorate.

In 2004, companies recorded 162,382 contacts about drinking water quality covering a range of concerns: discoloured water, water with an objectionable taste or odour, milky water, particles or visible organisms in water and health symptoms (nausea, diarrhoea, dry skin, rashes, sore throat). As can be seen from Table 3.6 consumer concern about drinking water is not uncommon with an average of three out of every 1,000 consumers (England/Wales combined) contacting their water company at least once during the year. The degree of concern varies considerably across the regions and with company and the reasons for this are discussed in more detail in the regional sections of Part 1 of this report.

The Inspectorate feels that those companies with higher than average rates of consumer contact (Northumbrian Water, United Utilities, Yorkshire Water, South East Water, South West Water and Wessex) need to improve their proactive communications with consumers. For example explaining the cause of dirty water and giving information about what is being done, and by when, to improve matters.

Table 3.6: Drinking water quality consumer contacts by company

Company	Population served	Drinking water quality information enquiries	Consumer contacts about drinking water quality concerns	Rate of consumer contacts per 1000 population
England				
Anglian Water	4,074,000	1580	9,969	2 per 1,000
Bristol Water	1,052,000	-	2,624	2 per 1,000
Bournemouth & West Hampshire	424,000	34	395	1 per 1,000
Cambridge Water	290,900	14	405	1 per 1,000
Cholderton & District Water	2,100	-	0	<1 per 1,000
Essex & Suffolk Water	1,738,700	735	2,061	1 per 1,000
Folkestone & Dover Water	157,900	-	231	1 per 1,000
Hartlepool Water	88,600	-	125	1 per 1,000
Mid Kent Water	579,300	-	867	1 per 1,000
Northumbrian Water	2,441,000	-	12,147	5 per 1,000
Portsmouth Water	664,600	-	290	<1 per 1,000
Severn Trent Water	7,280,000	-	9,946	1 per 1,000
South East Water	1,442,000	-	6,673	4 per 1,000
Southern Water	2,295,000	-	4,729	2 per 1,000
South Staffs Water	1,233,000	302	2,980	2 per 1,000
South West Water	1,500,000	1582	21,503	14 per 1,000
Sutton & East Surrey Water	642,000	18	903	1 per 1,000
Tendring Hundred Water	147,700	17	126	<1 per 1,000
Thames Water	8,085,000	7941	8,997	1 per 1,000

Table 3.6: Drinking water quality consumer contacts by company (continued)

Company	Population served	Drinking water quality information enquiries	Consumer contacts about drinking water quality concerns	Rate of consumer contacts per 1000 population
England				
Three Valleys Water	2,940,000	3303	6,395	2 per 1,000
United Utilities	6,950,000	5022	35,641	5 per 1,000
Wessex Water	1,181,000	-	3,265	3 per 1,000
Yorkshire Water	4,700,000	-	23,045	5 per 1,000
Totals	49,908,800	18,185	153,317	2 per 1,000
Wales				
Albion	470	0	7	n/a
Dee Valley Water	262,630	138	85	<1 per 1,000
Dwr Cymru Welsh Water	2,900,000	250	9,031	3 per 1,000
Totals	3,163,100	388	9,123	3 per 1,000
Note: Some columns contain dashes. This means enquiries are either not recorded by the company or enquiries/contacts are all classified as contacts.				

Inspectorate handling of consumer contacts about drinking water quality

Most consumer contacts about drinking water quality are handled effectively by water companies without reference to the Inspectorate. However, the Inspectorate occasionally receives calls from consumers who are not satisfied with the response of their water company. In 2004, the Inspectorate received and investigated 104 complaints from consumers about drinking water quality, a decrease of 38% compared with 2003. The largest number of these complaints related to the supply of discoloured water, with complaints about taste and odour also featuring highly.

The Inspectorate's investigation starts with asking the relevant water company to look into the matter and take remedial action where necessary. Additionally, where appropriate, the Inspectorate advises complainants on any action which they themselves could take. If the consumer remains dissatisfied with the water company's response, the Inspectorate investigates the complaint further. In some cases this will be done in association with the environmental health department of the relevant local authority. The Inspectorate also liaises closely with WaterVoice. Occasionally the

WaterVoice committee will refer a drinking water quality complaint to the Inspectorate for investigation.

Figure 3.8 shows how the 104 complaints investigated in 2004 by the Inspectorate relate to water companies. Since the companies vary in size, to give a fair and balanced comparison, the information is shown in terms of the number of complaints received by the Inspectorate per 100,000 population served by each water company.

Figure 3.7: Types of complaint investigated by the Inspectorate in 2004

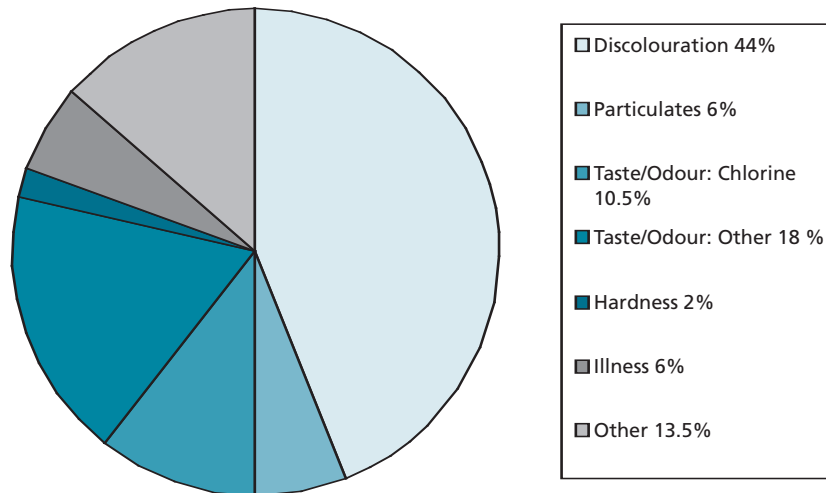
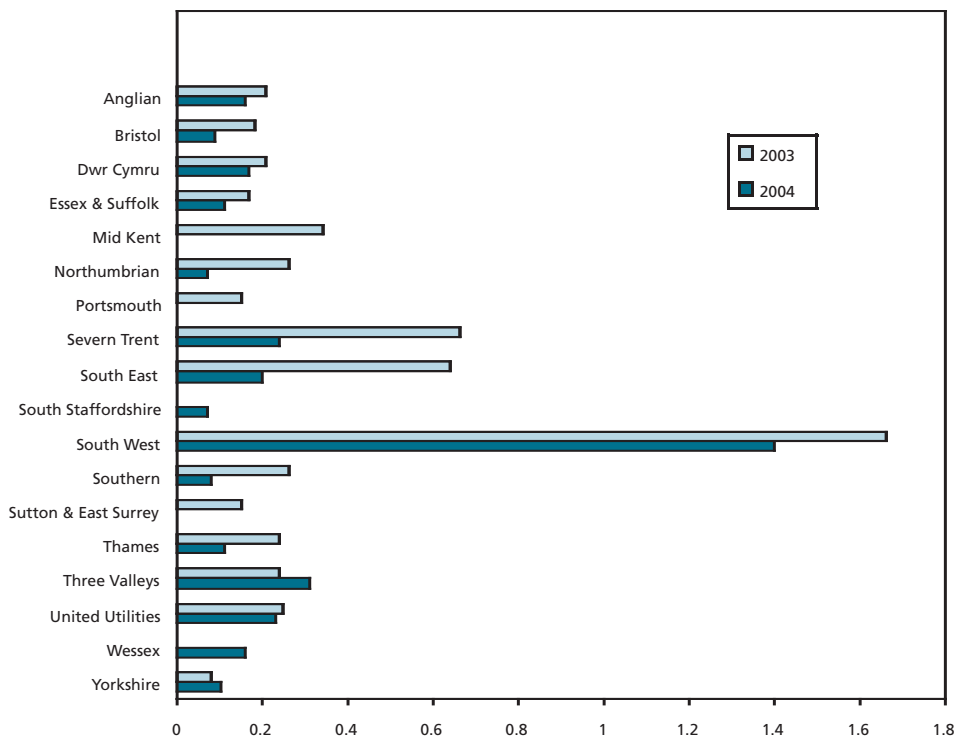


Figure 3.8: A comparison between numbers of complaints received for each water company per 100,000 of population – 2003 and 2004.



While most consumers who contact the Inspectorate have a concern about their drinking water quality, some are dissatisfied about the way their complaint was handled by the water company. During 2004, the Inspectorate carried out a technical audit of the way 16 companies handled a selected number of complaints. Generally companies had in place appropriate procedures for dealing with a drinking water quality complaint, however, where complaints had not been well handled it was normally due to a breakdown in communication within the company or with the consumer. Where appropriate, the Inspectorate suggests to companies how they can improve their handling of drinking water quality complaints.

It should be noted that the Inspectorate also receives a number of calls from persistent complainants, where it is not possible to establish a basis for their complaint or to resolve their concern.

Water company operational performance measures

In past years and based on the 1989 regulations, the Inspectorate has published performance information based on two measures (overall quality index OQI, and operational performance index OPI). Although these measures will continue to be calculated by the Inspectorate for use by water companies and the economic regulator (Ofwat), we consider these measures can be improved, not least because drinking water standards (and regulations) have changed. During 2004 the Inspectorate commenced work on developing new measures and this work is ongoing.

As reported in Part 1, consumers tell us that they expect clean safe drinking water and are concerned by discolouration of their water, particularly when it is orange-brown or black. This problem is also the focus of much of the improvement work being undertaken by companies. For this reason the Inspectorate believes there is merit in reporting this year on company performance on this particular aspect of drinking water quality. The measure used is OPI (TIM). This is OPI as used before, changed only by removing three parameters so it focuses more directly on just the three discoloured water problem parameters of turbidity, iron and manganese. The calculation remains the same in all other respects, therefore, it has been possible to calculate OPI (TIM) for past years to illustrate a trend.

As can be seen from Figure 3.9 the improving trend of previous years was not continued in 2004. The OPI (TIM) for 2004 for England and Wales (combined) was 99.79% the same as for 2003. From Table 3.10 it can be seen that companies with an OPI (TIM) value below the average for England and Wales are, for the most part, the companies yet to complete their programmes of distribution improvements (see Part 1 regional sections) or they have programmes of work to undertake in the AMP4 period (see Part 5 of this report).

We expect that completion of these distribution system improvement programmes will provide a further boost for consumers suffering from discoloured water problems.

However, it is equally important that water companies continue to invest sufficiently to maintain their assets. The Inspectorate has stated clearly its expectations that water companies will manage their supply arrangements proactively to prevent discolouration events, and will operate and maintain their assets with the consumers' interests in mind. We will continue to press companies and Ofwat to ensure appropriate funding arrangements are made to maintain, or improve where necessary, the aesthetic quality of drinking water at consumers' taps.

Figure 3.9 : Operational Performance Index (%) for three parameters 1997-2004

The graph represents the trend in operational performance index for three parameters, Turbidity, Iron and Manganese.

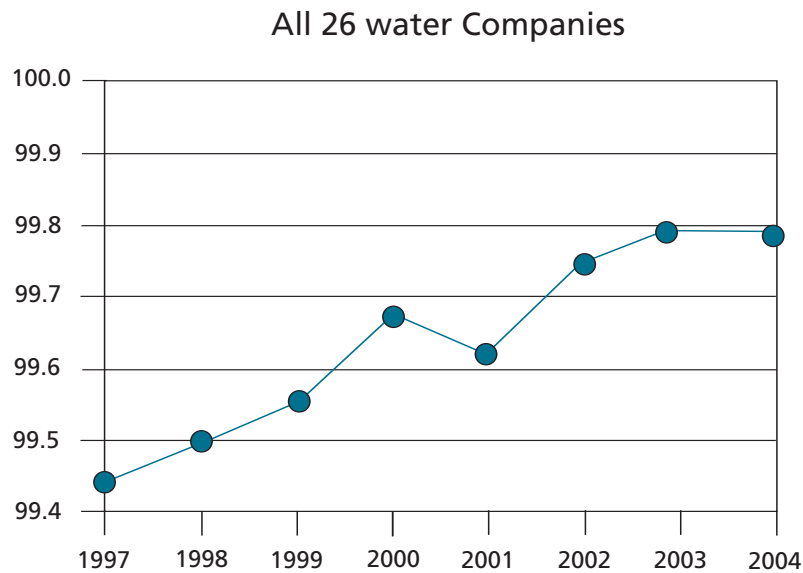


Table 3.10: Operational performance index for 3 parameters by company – 2004

Company	Operational Performance Index (%) (data based on Turbidity, Iron and Manganese)
Cambridge, Folkestone & Dover, Hartlepool, Portsmouth, South Staffordshire, Tendring Hundred	100.00
Bristol	99.94
Mid Kent Three Valleys	99.93
Thames	99.92
Southern	99.90
Dee Valley	99.86
Bournemouth & West Hampshire, Wessex	99.85
Anglian	99.83
Yorkshire	99.80
Essex & Suffolk	99.79
Mean for 26 companies	99.79
Sutton & East Surrey	99.72
Severn Trent	99.69
Northumbrian	99.66
South West, United Utilities	99.58
South East	99.57
Dwr Cymru	99.52
Cholderton	97.22
Note: Albion is not quoted separately as it consists of only one zone.	

Drinking Water Quality Results by Company

The Water Undertakers (Information) Direction 2004 requires companies to provide the Inspectorate with the results of tests taken for checking compliance with drinking water standards. The companies transfer data electronically to the Inspectorate from their corporate Laboratory Management Information Systems (LIMS). Data from 2004 are the first to be handled in this way and this represents a major new joint working arrangement between the companies and the Inspectorate. There was considerable consultation with the industry over a number of years leading to guidance that enabled companies to modify their systems, as necessary. In early 2004, and again in early 2005, the Inspectorate updated its guidance reflecting the joint learning from test data sent by companies. The key Information Letters on this topic are IL 6/2003, IL 01/2004 and IL 02/2005 available on the Inspectorate's website. The Inspectorate has continued to meet with the industry in 2005 to provide feedback on the performance of these data handling arrangements.

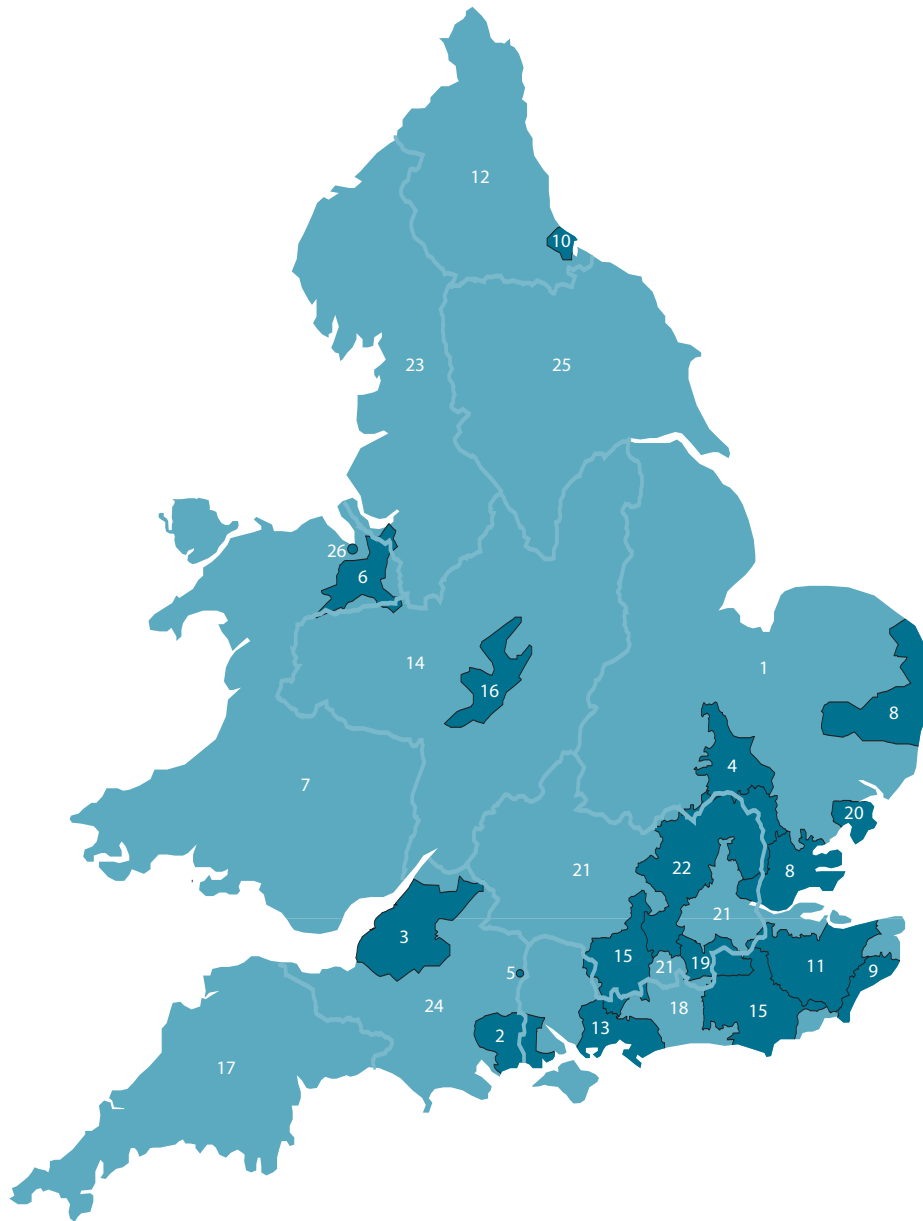
The data tables provided here represent the results of tests taken by the water companies as required by the Regulations. Tests are made on samples taken at water treatment works, supply points, service reservoirs or at consumers' taps (in zones). Tests required by the regulations are mandated either by Europe or Nationally. Also reported are the results of tests for indicator parameters for which monitoring is mandated by Europe but where there is not a universal standard set, instead results are required to meet a specification appropriate to the local circumstances. For 2004, these specifications have been set by companies and readers with enquiries about these should contact the company for more information.

Where there are less than 100 samples taken in the year for any parameter, the figures in the columns marked 1%ile and 99%ile are the maximum and minimum figures. Where over 100 samples have been taken then the values are the 1%ile and 99%ile figures.

As an aid to understanding the company tables that follow (and the regional reports in part 1), definitions for each parameter (test) are provided in Table 3.12.

Annex 3 explains the statistical methods used in the report.

Figure 3.11: Map of water companies and their areas of supply



- | | |
|---|----------------------------------|
| 1. Anglian Water | 15. South East Water |
| 2. Bournemouth and West Hampshire Water | 16. South Staffordshire Water |
| 3. Bristol Water | 17. South West Water |
| 4. Cambridge Water | 18. Southern Water |
| 5. Cholderton and District Water | 19. Sutton and East Surrey Water |
| 6. Dee Valley Water | 20. Tendring Hundred Water |
| 7. Dŵr Cymru Welsh Water | 21. Thames Water Utilities |
| 8. Essex and Suffolk Water | 22. Three Valleys Water |
| 9. Folkestone and Dover Water | 23. United Utilities |
| 10. Hartlepool Water | 24. Wessex Water |
| 11. Mid Kent Water | 25. Yorkshire Water Services |
| 12. Northumbrian Water | |
| 13. Portsmouth Water | Inset Appointment |
| 14. Severn Trent Water | 26. Albion Water |

Table 3.12: Drinking Water Quality Standards: Descriptions of parameters and standards in force from 1 January 2004 in England and Wales

Parameter	Mandatory European standards	Standard
Acrylamide	Acrylamide can occur in water as a result of traces present in polyacrylamides used in water treatment. It is controlled by means of product specification to limit the amount of the residual monomer.	0.1 µg/l
Antimony	Antimony is not normally found in water sources. Trace concentrations in drinking water can be derived from brass tap fittings and from solders.	5 µg/l
Arsenic	Arsenic is naturally present at levels above the standard in a few groundwater sources. Water companies have installed specific water treatment processes to remove arsenic at these sites.	10 µg/l
Benzene	Benzene is an organic chemical present in petrol. It is not normally found in water sources or supplies, though it can migrate through plastic underground supply pipes, if petrol is spilt in the vicinity.	1.0 µg/l
Benzo(a)pyrene (a PAH)	One of a group of compounds known as polycyclic aromatic hydrocarbons (PAH) see below. A stringent standard has been set for this individual substance based on its toxicity.	0.01 µg/l
Boron	Boron in water sources comes from the residues of detergent formulations that are present in treated sewage effluents. The concentrations present in drinking water are not of public health concern.	1 mg/l
Bromate	A disinfection by-product formed by the reaction of naturally occurring bromide with strong oxidants (usually ozone). A stringent standard has been set based on toxicity and best water treatment practice.	10 µg/l
Cadmium	Cadmium is only found at very low level in drinking water. These traces can arise from environmental contamination or dissolution of impurities in plumbing fittings.	5 µg/l
Chromium	Chromium is not present in water sources and is generally not found in drinking water.	50 µg/l
Copper	Copper in drinking water arises mostly as a result of copper pipes and fittings in household plumbing. In general, water supplies in the UK are not very aggressive towards copper.	2 mg/l
Cyanide	Cyanide is generally not present in water sources and it is not found in drinking water.	50 µg/l
1,2-Dichloroethane	1,2-Dichloroethane is a chemical intermediate and solvent. It can contaminate groundwater beneath industrial sites. Where necessary, special treatment is used to remove solvents from drinking water.	3 µg/l

Table 3.12: Drinking Water Quality Standards: Descriptions of parameters and standards in force from 1 January 2004 in England and Wales (continued)

Parameter	Mandatory European standards	Standard
Enterococci	Enterococci are bacteria found in the gut of all warm-blooded animals. They should not be present in drinking water and immediate action is required to identify and remove the source of faecal contamination.	0 per 100 ml
Epichlorhydrin	Epichlorhydrin can occur in water as a result of traces present in polyamine flocculants used in water treatment. It is controlled by means of product specification.	0.1 µg/l
<i>Escherichia coli</i> (<i>E. coli</i>)	<i>Escherichia coli</i> (<i>E. coli</i>) is a bacterium present in the gut of all warm-blooded animals. They should not be present in drinking water and immediate action is required to identify and remove the source of faecal contamination.	0 per 100 ml
Fluoride	Traces of fluoride occur naturally in many water sources, particularly groundwater. It is not removed by conventional water treatment. Some water companies are required to artificially fluoridate water supplies as a protection against tooth decay.	1.5 mg/l
Lead	Lead is only rarely present in water sources but may be present as a result of lead service pipes and plumbing particularly in areas with older properties. If the water supply tends to dissolve lead, water companies must protect the health of consumers by treating the water to reduce exposure.	25 µg/l (reduced to 10 mg/l by 2013)
Mercury	Mercury is not generally present in water sources or drinking water.	1 µg/l
Nickel	A few groundwater sites contain nickel and where necessary special water treatment can be installed to remove it. Nickel may also be present in coatings on modern taps and other plumbing fittings.	20 µg/l
Nitrate	Present naturally in all source waters, although higher concentrations tend to occur where fertilisers are used on the land. Where necessary, nitrate levels are reduced by water treatment (ion exchange or blending with low nitrate water).	50 mg/l
Nitrite	Traces of nitrite are produced when chlorine and ammonia are used together in the disinfection process to form chloramines, more stable and long lasting residual disinfectant. Levels are minimised through careful operation of the disinfection process.	0.5 mg/l
Pesticides aldrin, dieldrin Heptachlor and heptachlor epoxide	These persistent organo-chlorine compounds are no longer used in the UK and generally they are not found in water sources but a stringent standard has been set on the basis of their toxicity.	0.03 µg/l

Table 3.12: Drinking Water Quality Standards: Descriptions of parameters and standards in force from 1 January 2004 in England and Wales (continued)

Parameter	Mandatory European standards	Standard
Pesticides – other compounds	This group includes organic chemicals with a wide range of uses such as weed-killers, insecticides and fungicides. Many water sources contain traces of pesticide residues as a result of both agricultural and non-agricultural uses of pesticides on crops, and for weed control. Where necessary, water companies have installed water treatment processes to reduce pesticides (activated carbon and ozone).	0.1 µg/l
Pesticides – total	This parameter represents the sum of detectable concentrations of individual pesticides.	0.5 µg/l
Polycyclic aromatic hydrocarbons (PAH)	Polycyclic aromatic hydrocarbons are present in coal tar linings, which were used to protect water mains before 1970. Traces of PAH, at concentrations that are not of significance to health, may be found in drinking water if the original coal tar lining is still present. This parameter represents the sum of the concentration of four individual PAHs.	0.1 µg/l
Selenium	Selenium is an essential element, concentrations in drinking water sources and supplies are usually very much less than the standard.	10 µg/l
Tetrachloroethene and Trichloroethene	These solvents can be present at low concentrations in groundwater under industrial areas. Where necessary, specialist treatment is used to remove solvents from drinking water. The standard relates to the sum of the detectable concentrations of the two compounds.	10 µg/l
Trihalomethanes (THMs)	THMs are formed during the disinfection process by reaction between chlorine and mainly naturally-occurring organic substances. The use of chlorine in water treatment is a very important public health safeguard. Treatment processes are controlled to minimise the production of THMs.	100 µg/l
Vinyl chloride	Vinyl chloride can occur if there is residual monomer present in polyvinyl chloride (PVC) pipe. It is controlled by means of product specification.	0.5 µg/l

Table 3.12: Drinking Water Quality Standards: Descriptions of parameters and standards in force from 1 January 2004 in England and Wales (continued)

Parameter	Mandatory National standards	Standard
Aluminium	Occurs naturally in some source waters and is usually removed during the water treatment processes (coagulation and filtration). Additionally aluminium sulphate can be used as a water treatment chemical to remove cloudiness.	200 µg/l
Coliform bacteria	These bacteria are widely distributed in the environment, often as a result of human or animal activity but some grow on plant matter. Their presence in water supplies indicates a need to investigate the source of contamination. Coliform bacteria indicate whether water treatment, especially disinfection, is satisfactory. The standard applies as an absolute value at treatment works and must be met by 95% of samples taken at service reservoirs. At the consumers' tap they are an indicator parameter (see below).	0 per 100 ml
Colour	Colour occurs naturally in water from upland sources. It is removed by water treatment (coagulation and filtration).	20 mg/l Pt/Co scale
Iron	Present naturally in many waters and usually removed during water treatment. Iron in water supplies may also be derived from the corrosion of iron mains. Iron compounds are also used as water treatment chemicals.	200 µg/l
Hydrogen ion	See pH	
Manganese	Present naturally in many water sources and usually removed during water treatment.	50 µg/l
pH (Hydrogen ions)	pH value or hydrogen ion concentration gives an indication of the degree of acidity of the water. A pH of 7 is neutral; values below 7 indicate acidic characteristics and values greater than 7 indicate basic characteristics. A low pH value may result in pipe corrosion. An alkali may be added before supply so that corrosion is minimised. A tighter maximum indicator values also applies see below.	6.5–10.0
Odour and taste	Odour and taste occur naturally, particularly in surface water sources during the summer. The organic substances causing the odour and taste can be removed by water treatment process (activated carbon or ozone). The standard is measured by a panel evaluation of samples in the laboratory, to obtain a semi-quantitative taste and odour value.	Dilution No of 3 at 25 °C
Sodium	Sodium is a component of common salt, it is present in seawater and brackish groundwater and some water treatment chemicals contain sodium. Concentrations in drinking water are normally very low but some water softeners can significantly add to the sodium concentration.	200 mg/l

Table 3.12: Drinking Water Quality Standards: Descriptions of parameters and standards in force from 1 January 2004 in England and Wales (continued)

Parameter	Mandatory National standards	Standard
Tetrachloro-methane	This solvent can be present at low concentrations in groundwater under industrial areas. Where necessary, specialist treatment is used to remove solvents from drinking water.	3 µg/l
Turbidity	All source waters can at times become naturally cloudy. Turbidity is a quantitative measure of cloudiness, and levels are controlled by the treatment processes. It can also arise from disturbance of sediment within the distribution systems. This mandatory standard applies at consumer taps, a lower level triggers investigation at the treatment works (see below)	4 NTU
Parameter	Indicator parameters	Level or state above which investigation is required
Ammonium	Ammonium salts are naturally present in trace amounts in most water sources. They can indicate possible contamination of sanitary significance and they interfere with disinfection processes.	0.5 mg/l
Chloride	Chloride in drinking water originates from natural sources, it may also be due to local use of de-icing salt and saline intrusion.	250 mg/l
<i>Clostridium perfringens</i> (including spores)	<i>Clostridium perfringens</i> is a spore forming bacterium that is present in the gut of all warm-blooded animals. The spores can survive disinfection. The presence of spores in drinking water indicates a remote or intermittent source of contamination that requires investigation.	0 per 100ml
Coliform bacteria	See above	0 per 100 ml
Colony counts	Colony count measurements detect a wide range of micro-organism, the types and numbers detected depends on the media and temperature used. The test is of little value as a measure of pathogen risk but is a useful operational tool.	No abnormal change
Conductivity	Electrical conductivity is a measure of the amount of natural dissolved inorganic substances in source water.	2500 µS/cm
Sulphate	This occurs naturally in all source waters and is not removed during water treatment.	250 mg/l
Total indicative dose	Total indicative dose is a measure of the effective dose of radiation the body will receive from consumption of water. Its calculation is only required when screening values for gross alpha or gross beta are exceeded.	0.10 mSv/year

Table 3.12: Drinking Water Quality Standards: Descriptions of parameters and standards in force from 1 January 2004 in England and Wales (continued)

Parameter	Indicator parameters	Level or state above which investigation is required
Total organic carbon (TOC)	TOC represents the total amount of organic matter present in the water. The concentrations present in water do not present any risk to health.	No abnormal change
Tritium	Tritium is a radioactive isotope of hydrogen. It is not normally found in water sources. Discharge of radioactivity to the Environment is closely regulated by the Environment Agency.	100 Bq/l
Turbidity	All source waters can occasionally be naturally cloudy. Turbidity is a quantitative measure of cloudiness, and levels are controlled by the treatment processes. It can also arise from disturbance of sediment within the distribution systems. This level triggers investigation at treatment works, a higher mandatory level applies at consumers' taps (see above).	1 NTU

