

Part 2

Individual Water Company Performance in 2002

- A section on each of the four water companies describing their overall performance for the year and the extent to which they complied with the requirements of the Water Supply (Water Quality) Regulations 1989 and all its amendments.

General

- Each individual company section contains the following where appropriate:
 - A general statement about overall water quality in 2002
 - Company Information
 - Water Quality in Water Supply Zones, at Treatment Works, and in Service Reservoirs
 - Company Audit and Inspection
 - Incidents
 - Prosecutions (if any)
 - Improvement Programmes Carried Out by the Company
 - Enforcement Action

Comparison of Water Quality

The information given in the sections about water quality in each company's area indicates the extent to which the company has or has not complied with the requirements of the Water Quality Regulations. It should not be used simplistically to make comparisons of the overall quality of drinking water between different company areas or of the relative efficiency of different companies.

The quality of drinking water varies 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 better microbiological quality than water from many other types of source. In addition, it should be noted that for all parameters, the greater the number of samples taken, the more likely it is that breaches of the standards will be detected.

This is not to say that meaningful comparisons of water company performance cannot be made. The Inspectorate has developed statistical procedures for categorising water companies on the basis of quality of water supplied and on efficiency of managing treatment and distribution, and results obtained using these procedures are presented in Part 1 of this Report.

Microbiological Water Quality

The detection of coliforms in a sample does not mean that it is likely that the water supply will cause illness but is indicative of potential contamination that must be investigated immediately. The Regulations require 100% compliance with water quality standards for total and faecal coliforms at water treatment works, and for faecal coliforms at service reservoirs and in zones. They allow no more than 5% of samples taken in any year from service reservoirs or in zones to contain total coliforms in order to achieve compliance. Breaches may result in enforcement action unless the company has taken remedial action to prevent recurrence.

Breach of Standards

Reference to parameters that breached the standards in one or more samples does not mean that any of these breaches resulted in harm to the health of consumers. Only some of the parameters are of health significance and their standards are generally set with a wide margin of safety. The other parameters are of aesthetic significance, with standards set generally well below the level at which water would become unacceptable to consumers, and the breaching of those standards doesn't mean that the water is unfit to drink.

However, breach of a standard, even for only one parameter and in only one sample out of the large number taken from each water supply zone in the course of the year, is of significance because the water supplied at the time the sample was taken cannot be regarded as wholesome. When considered in the light of other results of monitoring, it may mean that some action is required in order to meet the high standards specified in the Regulations.

Consideration of Enforcement Action

For 2002, the Inspectorate has generally regarded a breach of a standard for an individual (non-microbiological) parameter on a single occasion in a water supply zone as trivial, provided that ten or more samples have been taken in that zone or, if a smaller number has been taken, provided that there was not a corresponding breach in 2001. In other cases, the Inspectorate has taken into account the number of determinations carried out and the number and the extent of the breaches in deciding whether the breaches were trivial or not.

The Inspectorate considers enforcement in all cases where the breaches are not regarded as trivial, unless the company has already taken remedial action to prevent a breach recurring or the Inspectorate judges that the breach is in any case unlikely to recur. A breach of the coliform standard at a consumer's tap is also regarded as trivial if the company can demonstrate beyond reasonable doubt that the breach arose solely as a result of the condition of the consumer's plumbing or tap from which samples were taken.

Quality Standards Table and Glossary

As an aid to understanding the company sections, definitions for all the individual parameters and many of the scientific terms used, can be found in the following Quality Standards Table or in the Glossary in the Annexes of this Report. These definitions apply to current regulations. For changes to be introduced under the new regulations see Chapter J, 'New Regulations and Associated Programme of Work', in Part 2

Substance	Description	Standard
Microbiological parameters		Amount Allowed
Faecal coliforms, faecal streptococci, <i>Clostridium perfringens</i>	Faecal coliforms, faecal streptococci and <i>Clostridium perfringens</i> are present in the gut of all warm-blooded animals. Their presence in water supplies indicates a need to take immediate action to remove the source of faecal pollution. Individual samples and tests are carried out for each organism. These organisms are controlled through the disinfection of water.	0 per 100 ml
Total coliforms	The coliform group of organisms is widely distributed in the environment, for example through human and animal activity and through vegetable matter. Their presence in water supplies indicates a need to investigate the source of contamination. Coliform numbers are controlled through the disinfection of water.	0 per 100 ml

Substance	Description	Standard
Chemical parameters		Amount Allowed
Alkalinity	The concentration of this parameter is an indication of the natural hardness and pH of the water.	No standard
Aluminium	Occurs naturally in some source waters. This aluminium is removed during the water treatment processes (coagulation and filtration) Aluminium sulphate can be used as a water treatment chemical to remove cloudiness.	200 µg/l
Ammonium	Ammonium salts are naturally present in trace amounts in most water sources. They decompose during disinfection.	0.5 mg/l
Antimony	Antimony is toxic and is not present in water sources. Trace concentrations in drinking water, which are not of any significance to health, can be derived from brass fittings and from solders.	10 µg/l
Arsenic	Naturally present at trace levels in a very few groundwater sources. Arsenic is toxic and when present it is removed by specialist water treatment processes.	50 µg/l
Barium	Occurs naturally in trace concentrations in some water sources. The concentrations present in water do not present any risk to health.	1000 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 water do not present any risk to health.	2000 µg/l
Cadmium	Cadmium is toxic and present at trace levels in a very few groundwater sources. When present it is removed by specialist water treatment processes.	5 µg/l
Calcium	Occurs naturally in all water sources and along with magnesium is responsible for the hardness of water, which causes scale in kettles and hot water systems. The concentrations present in water do not present any risk to health.	250 mg/l
Chloride	In association with sodium, chloride occurs naturally as a very dilute salt in all water sources and is not removed during water treatment. The concentrations present in water do not present any risk to health.	400 mg/l
Chlorine	Chlorine gas is used as a disinfectant in water treatment. It destroys bacteria derived from animal wastes and sewage effluents.	No standard
Chromium	Not present in water sources and is not found in drinking water.	50 µg/l
Colour	Colour occurs naturally in water from upland sources. Colour is removed during the water treatment processes (coagulation and filtration).	20 mg/l Pt/Co scale
Conductivity	Electrical conductivity is a measure of the amount of natural dissolved inorganic substances in source water. It is used to assist treatment control.	1500 µS/cm
Copper	Traces of copper, which are not significant to health, occur naturally in many water sources and significant concentrations may occur at consumers' taps as a consequence of copper pipes. The concentrations present in water do not present any risk to health.	3000 µg/l
Cyanide	Cyanide is toxic and is not present in water sources. It is not found in drinking water.	50 µg/l

Substance	Description	Standard
Chemical parameters		Amount Allowed
Fluoride	Traces of fluoride occur naturally in many water sources, particularly groundwater. It is not removed by conventional water treatment and some water companies artificially fluoridate water supplies as a protection against tooth decay. See the web site for more information on fluoridation of drinking water.	1500 µg/l
Hydrocarbon	Hydrocarbons include petroleum, mineral oils and other associated products of the petro-chemical industry. Very occasionally localised contamination of groundwater may occur or there may be permeation of plastic water pipes via contaminated ground conditions. The concentration present in water do not present any risk to health but might give rise to taste/odour.	10 µg/l
Hydrogen ion	See pH	
Iron	Present naturally in many water sources. This iron is removed during water treatment. Iron in water supplies may also be derived from corrosion of iron mains, but any concentrations present in water do not present any risk to health. Iron compounds are used as water treatment to remove cloudiness.	200 µg/l
Lead	Not normally present in water sources but may be present at consumers' taps if lead pipes are used. If the water supply tends to dissolve lead, water companies must protect the health of consumers and treat the water to reduce exposure.	50 µg/l
Magnesium	Occurs naturally in all water sources and along with calcium is responsible for the hardness of water, which causes scale in kettles and hot water systems. The concentrations present in water do not present any risk to health.	50 mg/l
Manganese	Present naturally in many water sources and is removed during water treatment.	50 µg/l
Mercury	Mercury is toxic and is not present in water sources or drinking water.	1 µg/l
Nickel	Not found in water sources. Traces found in drinking water may emanate from protective coatings on taps and fittings. These traces do not present a risk to health.	50 µg/l
Nitrate	Present naturally in all source waters, although higher concentrations can be caused by use of fertilisers. Where necessary, nitrate levels are reduced during water treatment (ion exchange or blending with low nitrate water). See the web site for information on health implications and control measures.	50 mg/l
Nitrite	Traces of nitrite are produced when chlorine and ammonia are used in the disinfection process. Levels are minimised through careful operation of the disinfection process. See the web site for more information (under 'nitrate').	0.1 mg/l
Oxidisability	The oxidisability of the water provides a measure of its organic content. This is an alternative measure of TOC.	5 mg/l

Substance	Description	Standard
Chemical parameters		Amount Allowed
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, are present in tap water if the original coal tar lining is still present.	0.2 µg/l
Benzo3,4 pyrene (a PAH)		10 ng/l
Pesticides	Many water sources contain traces of toxic pesticide residues as a result of agricultural and non-agricultural uses of pesticides on crops, and for weed control. Where necessary, water companies have installed special treatment processes to protect public health by removing pesticides (activated carbon and ozone processes). See the web site for information on pesticide removal.	0.1 µg/l
pH (Hydrogen ions)	pH value or hydrogen ion concentration gives an indication of the degree of acidity of the water. pH7 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 which is not harmful to health may be added before supply so that corrosion is minimised.	5.5–9.5
Phosphorus	Traces of phosphorus salts occur naturally in many water sources and high concentrations are associated with treated sewage effluents and agricultural fertilisers. Phosphates are also used in water treatment as a health protection measure to reduce lead content that may come from consumers' pipes. The concentrations present in water do not present any risk to health.	2200 µg/l
Potassium	This occurs naturally in all water sources and is not removed during water treatment. The concentrations present in water do not present any risk to health.	12 mg/l
Qualitative odour and taste	Odour and taste occur naturally, particularly in surface water sources during the summer. On site tests indicate any potential odour and taste. The organics causing the odour and taste are removed during the water treatment process (activated carbon or ozone).	No standard
Quantitative odour and taste	A formal method is undertaken in the laboratory to measure odour and taste in water. Individual tests are carried out, and any imperfections are removed during the treatment process as described above.	Dilution No of 3 at 25 °C
Selenium	Selenium is toxic and is not present in water sources and is not found in drinking water.	10 µg/l
Silver	This is not present in source waters and is not normally found in public drinking water. Silver may be used as a disinfectant for small private supplies.	10 µg/l
Sodium	In association with chloride, sodium occurs naturally as a very dilute salt in all water sources and is not removed during water treatment. The concentrations present in water do not present any risk to health.	150 mg/l

Substance	Description	Standard
Chemical parameters		Amount Allowed
Sulphate	This occurs naturally in all source waters and is not removed during water treatment. The concentrations present in unsoftened water do not present any risk to health.	250 mg/l
Surfactants	Surfactants in water sources come from the residues of detergent formulations that are present in treated sewage effluents. They are removed during treatment.	200 µg/l
Temperature	The temperature of surface waters varies according to the season. Groundwater has a much smaller variation in temperature range.	25 °C
Tetrachloroethene	These solvents can be present at low concentrations in groundwater under industrial areas. Where necessary, specialist treatment is used to protect public health by removing solvents from drinking water.	10 µg/l
Tetrachloro-methane		3 µg/l
Trichloroethene		30 µg/l
Trihalomethanes (THMs)	THMs are formed during the disinfection process by reaction between chlorine and mainly naturally-occurring organic substances. Treatment processes are controlled to minimise their production. See the web site for information on the control of THMs.	100 µg/l
Turbidity	All source waters are naturally cloudy occasionally. Turbidity is a quantitative measure of cloudiness, and levels are controlled by the treatment processes.	4 Formazin Turbidity Units
Total dried solids	This is a measure of the naturally-occurring minerals in water.	1500 mg/l
Total hardness	This represents the concentration of both naturally-occurring calcium and magnesium in the source water. Hard water can cause scale formation in kettles and hot water systems. The concentrations present in water do not present any risk to health.	No standard
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 significant increase
Zinc	Significant concentrations of zinc in water are only found in premises served by galvanised iron service pipes. Traces of zinc which are not of significance to health may emanate from solders.	5000 µg/l

Water and Sewerage Companies and Water-Only Companies of England and Wales

1. Anglian Water Services Limited (p.47)
2. Bournemouth and West Hampshire Water Plc (p.54)
3. Bristol Water Plc (p.59)
4. Cambridge Water company (p.65)
5. Cholderton and District Water Company Limited (p.71)
6. Dee Valley Water Plc (p.75)
7. Dŵr Cymru Cyfyngedig (p.80)
8. Essex and Suffolk Water Plc (p.87)
9. Folkestone and Dover Water Service Limited (p.93)
10. Hartlepool Water Plc (p.98)
11. Mid Kent Water Plc (p.103)
12. Northumbrian Water Limited (p.108)
13. Portsmouth Water Plc (p.114)
14. Severn Trent Water Limited (p.119)
15. South East Water Plc (p.125)
16. South Staffordshire Water Plc (p.131)
17. South West Water Limited (p.136)
18. Southern Water Limited (p.142)
19. Sutton and East Surrey Plc (p.148)
20. Tendring Hundred Water Services Limited (p.154)
21. Thames Water Utilities Limited (p.159)
22. Three Valleys Water Plc (p.165)
23. United Utilities Water PLC (p.171)
24. Wessex Water Services Limited (p.178)
25. Yorkshire Water Services Limited (p.184)

Inset Appointment

26. Albion Water Limited (p.191)

