
JerseyWater
2017
Water Quality Report
The Jersey New Waterworks Company Limited

Contents

Executive Summary

The quality of water supplied by the Company in 2017 was, once again, of a very high standard with an overall compliance rate of 99.98% with water quality requirements of the Water (Jersey) Law 1972 (2016: 99.99%). There were no instances of pesticides or nitrates exceeding regulatory limits in the treated water during the year and the bacteriological compliance of water leaving the treatment works was 100% (2016: 100%).

During 2017, the Company carried out nearly 15,000 regulatory analyses of treated water. Of these, just three were outside their respective regulatory parameter but posed no threat to health, details of which are contained on page 4.

The maximum concentration of nitrates detected in treated water in 2017 was 36.6mg/l; below the regulatory limit of 50mg/l and lower than the 2016 maximum of 40.7mg/l. This was the lowest level of nitrates recorded in treated water for many years and the 4th consecutive year in which nitrate concentrations in treated water remained within regulatory limits.

There were 91 water quality contacts in 2017 (2016: 117) from customers relating to concerns about the quality of water supplied and 37 contacts (2016: 45) requesting information. 33% of all contacts were related to discoloured water caused by rust. This represents a big drop in comparison to 2016, from 55 to 42, a 24% decrease. Whilst aesthetically displeasing this presents no risk to health.

There were fewer contacts for water quality information, falling from 45 to 37 in 2017. Consumer enquiries were made on a range of topics, from dishwasher settings related to water hardness to fluoride dosing (Jersey Water do not add fluoride to the water but there is a small amount naturally occurring in our streams and reservoirs, typically 0.1mg/l).

Untreated or raw water quality improved on 2016. Concentrations of nitrates in untreated water averaged 46.9 mg/l throughout the Island during the year, down from 52.1 mg/l in 2016. In addition, of the 47,000 analyses looking for 90 pesticides in untreated water, in 2017, there were 249 instances where concentartions were identified at over 0.1ug/l, compared to 376 in 2016.

Supply Points and Supply Zone Regulatory Results

Jersey Water adopts a risk based water quality monitoring programme, consistent with other water suppliers in Europe and elsewhere. This approach is consistent with the Company's Water Safety Plan, where potential risks are evaluated and water quality testing is designed to help manage those risks.

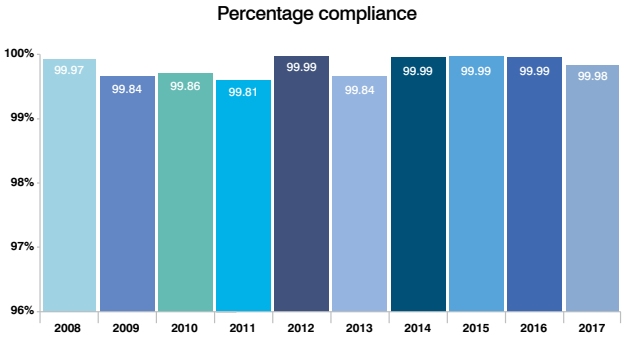
We examine samples from supply points (our two treatment works at Handois and Augres), service reservoirs at Westmount and Les Platons and the supply zone (distribution network) for compliance purposes at regular intervals throughout the year.

The company is required to undertake two kinds of regulatory water quality monitoring - check and audit monitoring.

Check monitoring is more frequent and is designed to ensure the treatment works are operating as expected and that the water in distribution is suitable for supply. Audit monitoring is performed less frequently and is designed to test the quality of the water supplied against the full requirements of the Water (Jersey) Law 1972.

Overall compliance

Water quality in 2017 was high with only three non¬compliant regulatory analyses identified out of 14,970 analyses taken for compliance purposes. Overall water quality compliance for 2017 was 99.98%, slightly down with the result for 2016 where a compliance rate of 99.99% was recorded following two instances of non-compliance.



Treatment works performance (supply points)

The company samples water leaving the treatment works to ensure that it complies with regulatory parameters before it enters the mains network. During 2017, the company took 534 samples throughout the year and tested them against 109 physical, bacteriological and chemical parameters. All of the 12,076 analyses were compliant with the regulatory limits, an improvement on 2016 where 2 samples were outside of the permitted range.

Detailed supply point results are set out in Appendix 1, 2 and 3.

Service reservoir performance

To comply with regulations, weekly microbiological and residual disinfection samples are taken from the service reservoirs to ensure there has been no deterioration in the water quality during storage. During 2017, 624 analyses were undertaken on 156 samples, all of which complied with the regulations.

Detailed service reservoir results are set out in Appendix 4.

Water quality in the distribution system (supply zone)

Sampling of water throughout the distribution network is undertaken in accordance with a risk assessed programme to ensure the water we supply meets physical, bacteriological and chemical standards. During 2017, 279 water samples were taken from all parts of the distribution system. Of the 2,270 analyses, all but 3 were compliant with regulatory limits:

- One of the samples outside the permitted range was for a coliform, detected in a sample taken at an end of main sampling point. Investigations into the water supply to that part of the distribution system showed all disinfection and distribution systems were satisfactory and repeat samples taken were negative for coliforms.
- An odour was detected in a sample sent to the U.K. for analysis. No related odour complaints were received from customers at the time this sample was taken and a repeat sample was negative for odour.
- One sample was slightly over regulatory limit of manganese but presented no risk to health. Investigations established that the treatment works supplying that area was operating satisfactorily and there were no significant activities in the local distribution network that could have disturbed the supply. Repeat samples were taken and all results were satisfactory.

Parameter	Date	Analysis type	Concentration recorded	Regulatory limit
Coliform	18/07/17	Check analysis	1 CFU per 100ml	0 CFU per 100ml
Odour	25/07/17	Check analysis	4 at 25^{0}C Dil No.	3 at 25^{0}C Dil No.
Manganese	03/10/17	Check analysis	58.8μg/l as Mn	50μg/l as Mn

Detailed supply zone results are set out in Appendix 5 and 6.

Consumer Contacts and Enquiries

Every contact and enquiry received by Jersey Water are recorded and categorised whether or not they require a visit to rectify an issue, and are listed on the table below:

Informing consumers

	Total	Consumer enquiries - sub categories (section 4.2)				
		Fluoride	Water hardness	Water quality report	Other information	
Total consumer enquiries (definition 3.1.1)	12	1	1	4	6	
		Consumer contact (drinking water quality concern) - sub categories (section 4.6)				
		Pets & other animals	Lead & other analysis	Incident related	Campaigns	Lifestyle
Total contacts drinking water quality concern (definition 3.1.5)	25	1	19	1	-	4
Zone total	37					
Zone rate (contact per 1,000 population)	0.41					

E&W Industry average 2016: 1.42

Acceptability of water to consumers

	Total	Consumer contact (appearance) - sub categories (section 4.3)						
		Discoloured - black/brown/ orange	Discoloured - blue/green	Particles	White - air	White - chalk	Animalcules	General condition
Total contacts appearance (definition 3.1.2)	63	42	1	5	11	0	-	4
		Consumer contact (taste and odour) - sub categories (section 4.4)						
		Chlorine	Earthy/musty	Petrol/ diesel	Other taste or odour			
Total contacts taste and odour (definition 3.1.3)	20	2	1	-	17			
		Consumer contact (illness) - sub categories (section 4.5)						
		Gastroenteritis	Oral	Skin	Medical opinion			
Total contacts illness (3.1.4)	8	6	0	1	1			
Zone total	91							
Zone rate (contact per 1,000 population)	1.01							

E&W Industry average 2016: 1.35

Fewer consumers contacted Jersey Water on both enquiries and water quality issues, compared to the England and Wales (E&W) industry averages. Of particular note there was a drop in the total number of acceptability of water to consumers contacts, from 117 in 2016 to 91 in 2017 – a reduction of 22%. This represents a zone rate (number of contacts per 1,000 consumers) of 1.01, over 25% less than the latest E&W Industry Average.

As in previous years discoloured water caused by rust is the most common issue consumers contact the Company about, with 33% of all contacts being in this sub category (Bl/Br/Or). This however is a drop in comparison to 2016, from 55 to 42 – a 24% decrease.

There were 37 contacts for water quality information in 2017, a slight decrease in consumer enquiries. They covered a range of topics from dishwasher settings related to water hardness to fluoride dosing (Jersey Water do not add fluoride to the water but there is a small amount naturally occurring in our streams and reservoirs, typically 0.1mg/l).

Bacteriological and chemical samples were taken where the consumer had suspected the water supply to be causing illness. Examinations showed the supply to meet quality standards.

In total 76 bacteriological samples were taken during the investigation of consumer contacts that the Jersey Water inspectors visited, one was not compliant due to a contaminated kitchen tap.

Raw Water Quality

For operational and monitoring purposes Jersey Water takes samples of water from streams, reservoirs and the inlet to the treatment works. This enables our operational staff to select the most suitable waters to be taken for treatment.

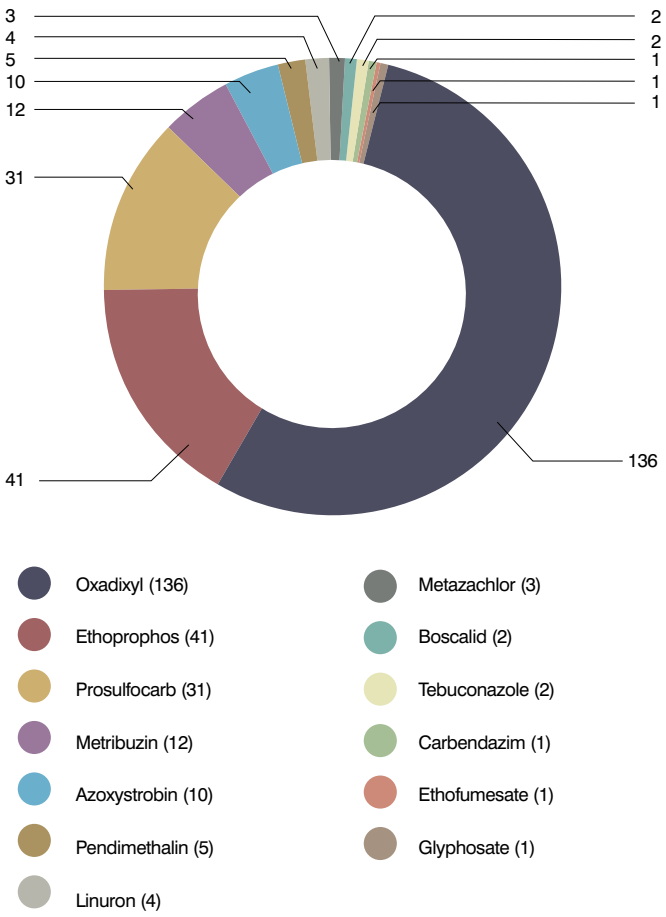
Nitrates

Whilst nitrates in treated water reached a peak of 36.6mg/l in March 2017, well below the regulatory limit of 50mg/l, this was only possible through the careful selection and blending of raw water during the potato growing season and the availability of low nitrate water collected in the reservoirs before the growing season began. Concentrations of nitrates in raw water peaked at 159.6mg/l in January 2017 in the Queens Valley Side Stream catchment and averaged 46.9 mg/l throughout the Island during the year, down from 52.1 mg/l in 2016.

Pesticides

Most analysis is carried out in the Jersey Water laboratory for physical, bacteriological and chemical parameters with samples being sent to our consulting analysts in the UK for pesticide analysis. In 2017, over 47,000 analyses were undertaken for 90 different pesticides in the stream courses and reservoir outlets, 249 were above the 0.1 μg/l limit compared to 376 in 2016. By careful selection of which reservoir to use and PAC dosing, there were no breaches of the pesticide limit in treated water.

2017 Number of Breaches in Streams and Reservoirs by Type of Pesticide



Understanding Test Results

This summary may help you better understand the 2017 test results on the following pages.

Regulatory Analyses

The Water (Jersey) Law 1972 as amended requires two types of monitoring at the treatment works and service reservoir outlets and in the distribution system.

- **Check monitoring**
  Tests performed on a frequent basis to ensure that the treatment works and the water in distribution is suitable for supply.
- **Audit monitoring**
  Testing performed less frequently than check monitoring and which is designed to test the quality of the water supplied against the full requirements of the Water (Jersey) Law 1972.

Key Terms

Term	Description
Substances and parameters	The item we are testing for.
Specific concentration or value (maximum) or state	The maximum or range of values allowed by law in the water supply (regulatory limit).
mg/l	Milligrams per litre or parts per million, equivalent to 1p in £10,000.
µg/l	Micrograms per litre or parts per billion, equivalent to 1p in £10,000,000.
µS/cm	The unit of measure commonly used for electrical conductivity in water, microSiemens/cm.
Sample Point	The location where the sample was taken.
Min	The minimum or lowest result produced for that test.
Mean	The average value of all the results produced for that test.
Max	The maximum or highest result produced for that test.
% Compliance	The percentage of the results that comply with the regulatory limit.
What it means	A description of what it is we are looking for and what it possibly indicates.

Appendix 1: 2017 Treatment Works Performance – Check Monitoring

Substances and parameters	Specific concentration or value (maximum) or state	Sample Point	Min	Mean	Max	% compliance	What it means
E.coli	0 per 100ml	Handois PS	0	0	0	100	Bacteria which are indicative of faecal pollution.
		Augres Tank	0	0	0	100	
Coliform bacteria	0 per 100ml	Handois PS	0	0	0	100	These bacteria are widely distributed in the environment and provide a sensitive measure of microbiological quality. They are removed during the treatment process.
		Augres Tank	0	0	0	100	
Colony counts	No abnormal change	Handois PS	No abnormal change			100	A range of harmless bacteria that may be present in water supplies. These are monitored to ensure the efficiency of the treatment process and cleanliness.
		Augres Tank				100	
Nitrite	0.1 mg NO_2/l	Handois PS	0.000	0.005	0.010	100	Nitrite may be associated with nitrate or with the use of ammonia in water disinfection.
		Augres Tank	0.000	0.005	0.015	100	
Residual disinfectant	No value mg Cl_2/l	Handois PS	0.42	0.55	0.73		Sufficient chlorine is added to all supplies to ensure the absence of harmful microorganisms.
		Augres Tank	0.30	0.47	0.60		
Turbidity	1 NTU	Handois PS	0.04	0.10	0.20	100	The Standard requires that there should be no haziness caused by fine particles.
		Augres Tank	0.04	0.08	0.19	100	
Conductivity	2500 μS/cm at 20°C	Handois PS	472	504	530	100	A measure of the ability of the water to conduct an electric current and therefore a measurement of the mineral salts dissolved in the water.
		Augres Tank	442	498	537	100	

Appendix 2: 2017 Treatment Works Performance – Audit Monitoring

Substances and parameters	Specific concentration or value (maximum) or state	Sample Point	Min	Mean	Max	% compliance	What it means
Benzene Bromate 1,2 dichloroethane Trichloroethene & Tetrachloromethane 1.0 µg/l	10 µg BrO_3/l 3.0 µg/l 10 µg/l 3 µg/l	Handois PS Augres Tank	All results were below limit of detection from all the sample points.			100 100 100 100 100	Benzene may be introduced into source water by industrial effluents or atmospheric pollution. Bromate can be associated with industrial pollution or can occur as a by-product of the disinfection process. The other compounds are all organic solvents, their presence is
Boron	1.0 mg B/l	Handois PS		0.197		100	Very low levels of these substances may occur naturally, but higher amounts could be associated with industrial pollution. The standards are health related but have a large built-in safety factor.
		Augres Tank		0.064		100	
Cyanide	50 µg CN/l	Handois PS	<2.0	<2.0	3.0	100	
		Augres Tank	<2.0	<2.0	<2.0	100	
Fluoride	1.5 mg F/l	Handois PS		0.078		100	Occurs naturally in many water sources. The standard is set to ensure no adverse effects. Jersey Water does not artificially fluoridate the water supplies.
		Augres Tank		0.069		100	
Chloride	250 mg Cl/l	Handois PS	52	64	79	100	Occurs naturally in most water sources. Levels above the standard could give rise to taste issues and contribute to corrosion.
		Augres Tank	49	54	61	100	

Substances and parameters	Specific concentration or value (maximum) or state	Sample Point	Min	Mean	Max	% compliance	What it means
Sulphate	250 mg SO_4/l	Handois PS	67	75	88	100	Dissolves in water after contact with certain mineral deposits. Excess levels can contribute to corrosion.
		Augres Tank	58	82	95	100	
Total Organic Carbon	No abnormal change	Handois PS	1.60	1.79	2.00	100	This parameter assesses the organic content of the water.
		Augres Tank	1.40	1.76	2.30	100	
Gross Alpha	0.1 Bq/l	Handois PS	<0.020	<0.020	0.020	100	These parameters are measured as part of screening for radioactivity.
		Augres Tank	<0.020	<0.020	<0.020	100	
Gross Beta	1.0 Bq/l	Handois PS	<0.20	<0.20	<0.20	100	
		Augres Tank	<0.20	<0.20	0.23	100	

Appendix 3: 2017 Treatment Works Pesticide Analysis – Audit Monitoring

A suite of 106 pesticides have been analysed during 2017 at the treatment works outlets, the following table shows the ones that were detected above 0.004 µg/l – there were 85 substances that were not.

Substances and parameters	Specific concentration or value (maximum) or state	Sample point	Min	Mean	Max	% compliance
2,4-D	0.1 µg/l	Augres Tank	<0.005	<0.005	<0.005	100
		Handois PS	<0.005	<0.005	0.013	100
Atrazine Desisopropyl	0.1 µg/l	Augres Tank	<0.005	<0.005	0.008	100
		Handois PS	<0.005	<0.005	0.008	100
Azoxystrobin	0.1 µg/l	Augres Tank	<0.005	<0.005	0.010	100
		Handois PS	<0.005	<0.005	<0.005	100
Bentazone	0.1 µg/l	Augres Tank	<0.005	<0.005	0.006	100
		Handois PS	<0.005	<0.005	<0.005	100
Clopyralid	0.1 µg/l	Augres Tank	<0.005	0.005	0.022	100
		Handois PS	<0.005	0.005	0.019	100
Diuron	0.1 µg/l	Augres Tank	<0.005	<0.005	0.007	100
		Handois PS	<0.005	<0.005	0.007	100
Ethoprophos	0.1 µg/l	Augres Tank	<0.005	<0.005	0.013	100
		Handois PS	<0.005	0.007	0.041	100
Fenpropidin	0.1 µg/l	Augres Tank	<0.005	<0.005	0.007	100
		Handois PS	<0.005	<0.005	0.008	100
Fenpropimorph	0.1 µg/l	Augres Tank	<0.005	<0.005	<0.005	100
		Handois PS	<0.005	<0.005	0.009	100
Fluroxypyr	0.1 µg/l	Augres Tank	<0.005	<0.005	<0.005	100
		Handois PS	<0.005	<0.005	0.009	100
Glyphosate	0.1 µg/l	Augres Tank	<0.005	<0.005	<0.005	100
		Handois PS	<0.005	0.012	0.047	100

Substances and parameters	Specific concentration or value (maximum) or state	Sample point	Min	Mean	Max	% compliance
Lenacil	0.1 µg/l	Augres Tank	<0.005	<0.005	<0.005	100
		Handois PS	<0.005	<0.005	0.056	100
Mecoprop (MCPP)	0.1 µg/l	Augres Tank	<0.005	<0.005	<0.005	100
		Handois PS	<0.005	<0.005	0.007	100
Metazachlor	0.1 µg/l	Augres Tank	<0.005	<0.005	0.007	100
		Handois PS	<0.005	<0.005	0.007	100
Metribuzin	0.1 µg/l	Augres Tank	<0.005	<0.005	0.026	100
		Handois PS	<0.005	<0.005	0.019	100
Mevinphos	0.1 µg/l	Augres Tank	<0.005	<0.005	<0.005	100
		Handois PS	<0.005	<0.005	0.009	100
Oxadixyl	0.1 µg/l	Augres Tank	0.012	0.025	0.046	100
		Handois PS	0.024	0.043	0.056	100
Pendimethalin	0.1 µg/l	Augres Tank	<0.005	<0.005	0.005	100
		Handois PS	<0.005	<0.005	0.005	100
Pirimicarb	0.1 µg/l	Augres Tank	<0.005	<0.005	<0.005	100
		Handois PS	<0.005	<0.005	0.005	100
Prosulfocarb	0.1 µg/l	Augres Tank	<0.005	0.005	0.052	100
		Handois PS	<0.005	0.008	0.044	100
Triclopyr	0.1 µg/l	Augres Tank	<0.007	<0.007	<0.007	100
		Handois PS	<0.007	<0.007	0.011	100
Total Pesticides	0.5 µg/l	Augres Tank	0.015	0.037	0.117	100
		Handois PS	0.041	0.066	0.180	100

Appendix 4: 2017 Service Reservoir Performance – Check Monitoring

Substances and parameters	Specific concentration or value (maximum) or state	Sample Point	Min	Mean	Max	% compliance	What it means
E.coli	0 per 100ml	Les Platons East SR	0	0	0	100	Bacteria which are indicative of faecal pollution.
		Les Platons West SR	0	0	0	100	
		Westmount SR	0	0	0	100	
Coliform bacteria	0 per 100ml (95% of samples)	Les Platons East SR	0	0	0	100	These bacteria are widely distributed in the environment and provide a sensitive measure of microbiological quality. They are removed during the treatment process.
		Les Platons West SR	0	0	0	100	
		Westmount SR	0	0	0	100	
Colony counts	No abnormal change	Les Platons East SR	No abnormal change			100	A range of harmless bacteria that may be present in water supplies. These are monitored to ensure the efficiency of the treatment process and the cleanliness (increasing trends in the distribution system are investigated)
		Les Platons West SR				100	
		Westmount SR				100	
Residual disinfectant	No value mg Cl_2/l	Les Platons East SR	0.09	0.22	0.55	100	Sufficient chlorine is added to all supplies to ensure the absence of harmful microorganisms.
		Les Platons West SR	0.10	0.24	0.42	100	
		Westmount SR	0.06	0.14	0.26	100	

Appendix 5: Water Quality in the Supply Zone – Check Monitoring

Substances and parameters	Specific concentration or value (maximum) or state	Min	Mean	Max	% compliance	What it means
E.coli	0 per 100ml	0	0	0	100	Bacteria which are indicative of faecal pollution
Coliform bacteria	0 per 100ml	0	0	1	99.6	These bacteria are widely distributed in the environment and provide a sensitive measure of microbiological quality. They are removed during the treatment process.
Residual disinfectant	No value mg Cl_2/l	<0.02	0.15	0.58		Chlorine is added to our water along with ammonia to form a stable chloramine disinfectant compound, to ensure that there are no harmful bacteria in the water we supply.
Aluminium	200 µg Al/l	<20	<20	35	100	Occurs naturally in many water resources. Aluminium compounds are also used at some water treatment works to remove impurities, but are themselves removed in the process
Ammonium	0.50 mg NH_4/l	<0.01	0.04	0.25	100	May be naturally present in some waters and is not harmful.
Colony counts	No abnormal change	No abnormal change			100	A range of harmless bacteria that may be present in water supplies. These are monitored to ensure the efficiency of the treatment process and the cleanliness (increasing trends in the distribution system are investigated)
Colour	20 mg/l Pt/Co	0.56	1.98	5.79	100	Water should be clear and bright but natural organic matter or pipework corrosion products may occasionally impart a slight tint.
Conductivity	2500 µS/cm at 20°C	448	507	540	100	A measure of the ability of the water to conduct an electric current and therefore a measurement of the mineral salts dissolved in the water.
Enterococci	0 per 100ml	0	0	0	100	Bacteria which are indicative of faecal pollution

Substances and parameters	Specific concentration or value (maximum) or state	Min	Mean	Max	% compliance	What it means
Hydrogen ion	10.0 pH value 6.5 (min)	7.26	7.64	7.95	100	A measure of acidity or alkalinity. Excessively acidic or alkaline water can contribute to corrosion of pipes and fittings.
Iron	200 μg Fe/l	<4	19.0	127.6	100	Iron may be associated with the corrosion of old iron mains. The standard has been set for aesthetic reasons as levels persistently above the standard can give rise to discoloured water.
Manganese	50 μg Mn/l	<0.9	4.5	58.8	98.7	Occurs naturally in many water sources. The standard is set for aesthetic reasons as black deposits of manganese dioxide can give rise to discoloured water.
Nitrate	50 mg NO_3/l	15.1	26.0	36.6	100	Nitrate arises from the use of fertilisers in agriculture and may be minimised by good practices and appropriate controls.
Nitrite	0.5 mg NO_2/l	<0.003	0.027	0.104	100	Nitrite may be associated with nitrate or with the use of ammonia in water disinfection.
Nitrate/Nitrite ratio	1.000	0.310	0.530	0.766	100	The regulations specify that the ratio according to the following formula must not exceed 1, [nitrate]/50 + [nitrite]/3, where the square brackets signify the concentrations in mg/l for nitrate (NO3) and nitrite (NO2) respectively.
Taste & Odour	3 at 25°C Dilution number	0	0	4	99.3	The water is examined the water for unpleasant taste or odour. These are set for aesthetic reasons.
Turbidity	4 NTU	0.05	0.13	0.38	100	The Standard requires that there should be no haziness caused by fine particles.
Cyanide	50 μg CN/l	<2.0	<2.0	3.0	100	Very low levels may occur naturally, but higher amounts could be associated with industrial pollution. The standards are health related but have a large built-in safety factor.

Appendix 6: Water Quality in the Supply Zone – Audit Monitoring

Substances and parameters	Specific concentration or value (maximum) or state	Min	Mean	Max	% compliance	What it means
Antimony	5.0 µg Sb/l		0.250		100	Very low levels may occur naturally, but higher amounts could be associated with industrial pollution. The standards are health related but have a large built-in safety factor.
Arsenic	10 µg As/l		<0.5		100	
Cadmium	5.0 µg Cd/l		<0.08		100	
Chromium	50 µg Cr/l		<0.5		100	
Benzene	1.0 µg/l		<0.02		100	Benzene may be introduced into source water by industrial effluents or atmospheric pollution.
Boron	1.0 mg B/l		0.074		100	Very low levels may occur naturally, but higher amounts could be associated with industrial pollution. The standards are health related but have a large built-in safety factor.
Copper	2000 µg Cu/l	<4	11	73	100	Any significant amount of copper is likely to come from corrosion of customers' pipes or fittings. Excess amounts can cause a metallic taste.
1,2 dichloroethane	3.0 µg/l	<0.04	<0.04	<0.04	100	The presence of this organic solvent is an indication of industrial pollution.
Lead	10 µg Pb/l	<0.5	<0.5	0.90	100	Absent in water entering supply but variable concentrations of lead may be found in water at the customer's tap in older properties built at a time when lead was commonly used in domestic plumbing systems. The standard recognises that the intake of lead should be minimised for health reasons.
Nickel	20 µg Ni/l		0.90		100	Very low levels may occur naturally, but higher amounts could be associated with industrial pollution. The standards are health related but have a large built-in safety factor.

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