Affinity Water

Your local supply, on tap

Annual Report on Water Quality
Hertsmere Borough Council 2013

Affinity Water

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1 Introduction

Affinity Water produces an annual report for each local authority regarding the general quality of water supplied to premises in the authority's area. The information includes results of samples taken from water supply zones in the authority's area of responsibility and any associated exceedences (see section 3 Water Quality) relevant to those supply areas i.e. exceedences from supplying water treatment works and service reservoirs. The report also includes details of the actions taken to comply with any enforcement orders, authorised departures and notices under regulation 19(4). This report is for Hertsmere Borough Council and covers the year ending 31 December 2013.

2 Water Treatment Works, Service Reservoirs and Water Supply Zones

A map of the water treatment works, service reservoirs and water supply zones within the Council's area is included in Appendix 1.

In 2013, the Company met the demand for drinking water by operating 83 water treatment works. The water supply to the area covered by the Council was provided by the following WTWs:

Clay Lane 27"
Clay Lane 36"
Iver
North Mymms
Queens
Waterhall

In addition to the above Company-operated water treatment works there was a bulk import of treated water from Anglian Water's Grafham water treatment works. This was used as a supplementary supply to assist demand management.

Treated water from the above works is either passed directly into supply or via one of the following service reservoirs:

Arkley 1 & 2
Arkley 3 & 4
Arkley WT
Brookmans Park
Brookmans Park WT
Bushey Heath 1
Bushey Heath 2
Bushey Heath 3
Bushey Heath 5 East
Bushey Heath 5 West
Epping Green WT
Hatfield

Merry Hill East
Merry Hill West

The Company's area is divided into discrete Water Supply Zones, each with a population of 100,000 or less. In 2013, Affinity Water (Central Region) had 71 such zones.

In 2013, Hertsmere Borough Council's area was served by Zones:

023 Hatfield / Potters Bar
049 Borehamwood / Bushey
050 Barnet
052 Pinner / Stanmore
072 Shenley

Results of analyses for the above Zones can be found in Appendix 2.

3 Water Quality

During 2013 elevated levels of the pesticide metaldehyde were detected three times in Zone 023, in March, May and October. At these times, this zone was supplied from our North Mymms water treatment works. The raw waters that feed this treatment works have been found to contain metaldehyde and at present there are no known practical treatment processes that remove metaldehyde. An Undertaking (see section 5. below) is in place for zones supplied by North Mymms water treatment works. The levels of metaldehyde detected were well below that which could affect public health.

All exceedences of the standards are reported to the Drinking Water Inspectorate (DWI) in monthly exception reports. In the event that the DWI is not satisfied with the Company's explanation of the circumstances and the action taken, enforcement action can be initiated.

4 Cryptosporidium

Listed below is a summary of the results for Cryptosporidium from treatment works that were originally identified as being at significant risk from Cryptosporidium and which supply water to the area covered by the Council.

Treatment Works	No. of samples taken in 2013	No. of samples containing oocysts	Maximum Concentration (Oocysts/10 litres)
Iver	365	0	<0.05

5 Customer Contacts

Under the Water Industry (Suppliers' Information) Direction 2009, the Company must provide the DWI with annual information on all consumer contacts received related to drinking water quality. For each water supply zone, the consumer contacts are separated into five main categories (with further division into sub-categories). An overall rate of contact per 1000 population is calculated for each zone as well as contact rates for combined categories.

The customer contact data for water supply zones within your Council's area of responsibility is shown in the table below.

Zone (Pop.)	Zone Rate (Enquiries & Drinking Water Quality Concern per 1000 population)	Zone Rate (Appearance, taste and odour & illness per 1000 pop.)	Overall zone rate (Contacts per 1000 pop.)
Company average	**0.48**	**1.08**	**1.57**
Zone 023 (82,332)	0.55	0.87	1.42
Zone 049 (80,453)	0.66	1.49	2.15
Zone 050 (49,092)	0.57	0.84	1.41
Zone 052 (70,859)	0.51	1.34	1.85
Zone 072 (3,074)	0.00	0.00	0.00

6 Section 19 Undertakings, Authorised Departures & Programmes of Work

Within the Council's area of supply there are Undertakings in place for Zones 023 and 050 relating to Metaldehyde & Total Pesticides for the Company's North Mymms and Iver WTWs and for the bulk import of treated water from Anglian Water's Grafham WTW. In all cases the Company has agreed to: implement a monitoring strategy; engage in catchment management activities, including support for voluntary initiatives to influence Metaldehyde use, in order to reduce concentrations in untreated waters; to engage with & provide data to relevant stakeholders; review possible alternative supply arrangements; optimise removal through current treatment processes; investigate new, sustainable treatment processes; and to continually review & appraise the risk from these hazards as part of the Regulatory process.

The Company did not have any Authorised Departures in place in the Council's area during 2013.

In order to meet the standard relating to lead, the Company has continued operating orthophosphate dosing plants at 35 sites across the Company's area. All the zones within the Council's area receive water dosed with orthophosphate.

7 Notifiable events

Under the Water Industry (Suppliers Information) Direction 2009, the DWI must be notified of any situation where water quality is likely to be, or has been, adversely affected. Since 2009 the DWI has been using an event classification system to assess and quantify the significance of a notifiable event, giving each one a number (1 to 5) with an equivalent rating ("not significant" through to "major"). The Company regards any event classified as a 3 Significant or above as being equivalent to the previously designated 'incident'.

During 2013 there were no such notifiable events within your Council's area of responsibility.

8 Further information and advice

For further information and advice on all water quality matters please contact:

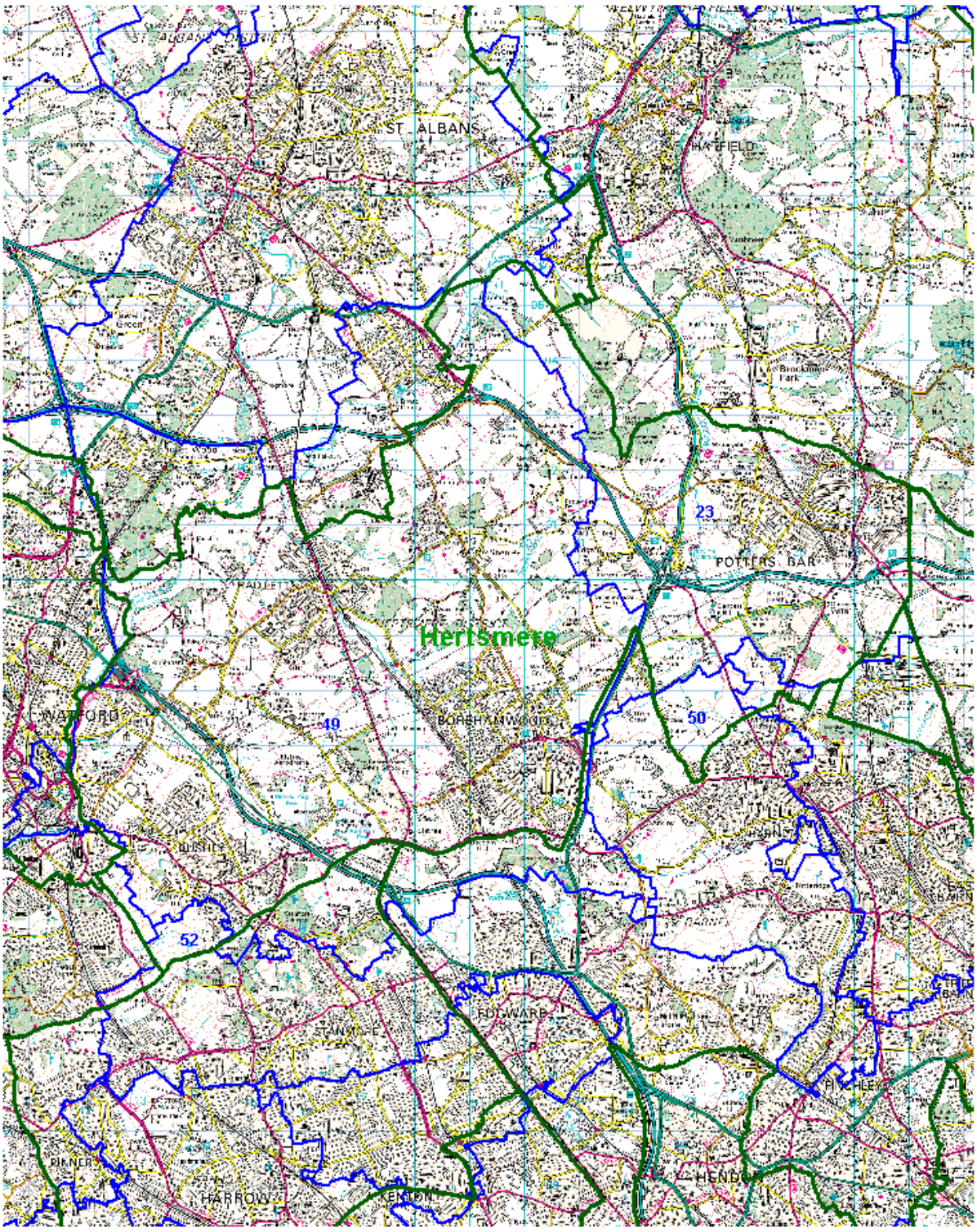
Eddie Lintott
Water Quality Manager
Affinity Water
Tamblin Way
Hatfield
Hertfordshire
AL10 9EZ

Telephone: 01707 277165

Appendix one

Map

Hertsmere Borough Council



Local Authority Boundary
Water Supply Zone Boundary

Appendix two

Water Quality Results

Water Supply Zone: Hatfield/Potters Bar (AF023)
Period: 01 January 2013 to 31 December 2013
Population: 77886

Parameter	Units	No. of Samples	PCV	No. of Samples >PCV	% of Samples >PCV	Min.	Mean	Max.
Microbiological Parameters								
Coliform bacteria	No./100ml	204	0	0	0	0	0	0
E coli	No./100ml	204	0	0	0	0	0	0
Clostridium perfringens	No./100ml	38	0	0	0	0	0	0
Enterococci	No./100ml	8	0	0	0	0	0	0
2 day plate count 37 °C	No./1ml at 37 °C	76	No abnormal change	0	0	0	13	490
3 day plate count 22 °C	No./1ml at 22 °C	76	No abnormal change	0	0	0	16	900
Customer Parameters								
Alkalinity	mgHCO_3/l	1	No PCV	0	0	306	306	306
Calcium	mgCa/l	1	No PCV	0	0	115	115	115
Chlorine (Residual)	mgCl_2/l	204	No PCV	0	0	0.04	0.18	0.44
Colour	mg/l Pt/Co	38	20	0	0	<1.0	<1.0	<1.0
Fluoride	mgF/l	8	1.5	0	0	0.120	0.150	0.186
Hardness (Total)	mg$CaCO_3$/l	1	No PCV	0	0	288	288	288
Hydrogen Ion (pH)	pH value	76	6.5-9.5	0	0	6.8	7.2	7.5
Quantitative Odour	Dilution No.	38	Abnormal & unacceptable to	0	0	0	0	0
Quantitative Taste	Dilution No.	38	consumers	0	0	0	0	0
Temperature	°C	201	No PCV	0	0	6.3	12.3	20.4
Turbidity	NTU	76	4	0	0	0.05	0.15	0.40
Chemicals								
Metals								
Arsenic	µgAs/l	8	10	0	0	<1.0	<1.0	<1.0
Aluminium	µgAl/l	76	200	0	0	<5.0	<5.0	22.6
Antimony	µgSb/l	8	5	0	0	<0.20	<0.20	<0.20
Cadmium	µgCd/l	8	5	0	0	<0.20	<0.20	<0.20
Chromium	µgCr/l	8	50	0	0	<2.0	<2.0	<2.0
Copper	mgCu/l	8	2	0	0	<0.010	0.035	0.072
Iron	µgFe/l	76	200	0	0	<15.0	<15.0	64.0
Lead	µgPb/l	8	25	0	0	<1.00	1.08	3.98
Manganese	µgMn/l	76	50	0	0	<1.0	<1.0	1.5
Mercury	µgHg/l	8	1	0	0	<0.10	<0.10	<0.10
Nickel	µgNi/l	8	20	0	0	<2.0	<2.0	3.5
Sodium	mgNa/l	8	200	0	0	10.5	21.9	27.0

Parameter	Units	No. of Samples	PCV	No. of Samples >PCV	% of Samples >PCV	Min.	Mean	Max.
Pesticides								
Atrazine	µg/l	8	0.1	0	0	0.007	0.010	0.015
Bentazone	µg/l	8	0.1	0	0	<0.008	<0.008	<0.008
Carbendazim	µg/l	8	0.1	0	0	<0.005	<0.009	<0.009
Carbetamide	µg/l	8	0.1	0	0	<0.008	<0.009	0.010
Chlorotoluron	µg/l	8	0.1	0	0	<0.005	<0.007	<0.007
Clopyralid	µg/l	8	0.1	0	0	<0.008	<0.012	0.012
Cyanazine	µg/l	8	0.1	0	0	<0.007	<0.007	<0.007
Dicamba	µg/l	8	0.1	0	0	<0.007	<0.011	<0.011
Dichlobenil	µg/l	8	0.1	0	0	<0.006	<0.006	<0.006
Dichlorprop	µg/l	8	0.1	0	0	<0.008	<0.008	<0.008
Diuron	µg/l	8	0.1	0	0	<0.006	<0.009	<0.009
Fluroxypyr	µg/l	8	0.1	0	0	<0.008	<0.008	<0.008
Glyphosate	µg/l	8	0.1	0	0	<0.002	<0.010	<0.010
Isoproturon	µg/l	8	0.1	0	0	<0.004	<0.006	<0.006
Linuron	µg/l	8	0.1	0	0	<0.008	<0.009	<0.009
MCPA	µg/l	8	0.1	0	0	<0.008	<0.008	<0.008
MCPB	µg/l	8	0.1	0	0	<0.008	<0.010	<0.010
Mecoprop	µg/l	8	0.1	0	0	<0.008	<0.008	<0.008
Metaldehyde	µg/l	8	0.1	3	38	<0.009	0.091	0.139
Metazachlor	µg/l	8	0.1	0	0	<0.005	<0.008	<0.008
Methabenzthiazuron	µg/l	8	0.1	0	0	<0.005	<0.009	<0.009
Prometryn	µg/l	8	0.1	0	0	<0.003	<0.008	<0.008
Propyzamide	µg/l	8	0.1	0	0	<0.005	<0.005	0.013
Simazine	µg/l	8	0.1	0	0	<0.008	<0.008	0.008
Terbutryn	µg/l	8	0.1	0	0	<0.005	<0.009	<0.009
Total Pesticide	µg/l	8	0.5	0	0	0.023	0.112	0.155
Tri-allate	µg/l	8	0.1	0	0	<0.004	<0.004	<0.004
Trietazine	µg/l	8	0.1	0	0	<0.006	<0.008	<0.008
2,4-D	µg/l	8	0.1	0	0	<0.008	<0.008	<0.008
Additional Parameters								
Ammonium	mgNH_4/l	38	0.5	0	0	<0.04	<0.04	<0.04
Benzene	µg/l	8	1	0	0	<0.02	<0.02	<0.02
Benzo (a) Pyrene	µg/l	8	0.01	0	0	<0.001	<0.001	0.001
Boron	mgB/l	8	1	0	0	<0.100	<0.100	<0.100

Parameter	Units	No. of Samples	PCV	No. of Samples >PCV	% of Samples >PCV	Min.	Mean	Max.
Additional Parameters (continued)								
Bromate	µgBrO_3/l	8	10	0	0	<0.5	0.6	2.3
Chloride	mgCl/l	8	250	0	0	20	41	49
Electrical Conductivity at 20 °C	µS/cm at 20 °C	76	2500	0	0	518	649	766
Nitrate	mgNO_3/l	8	50	0	0	24.0	26.9	30.3
Nitrite	mgNO_2/l	8	0.5	0	0	<0.008	<0.008	0.013
Nitrite Nitrate Formula		8	1	0	0	<0.51	<0.61	<0.61
Selenium	µgSe/l	8	10	0	0	<1.0	<1.0	<1.0
Sulphate	mgSO_4/l	8	250	0	0	14	50	69
Sum of Tri & Tetrachloroethene	µg/l	8	10	0	0	0.0	0.0	0.0
Tetrachloromethane	µg/l	8	3	0	0	<0.1	<0.1	<0.1
Total Cyanide	µgCN/l	8	50	0	0	<0.5	<3.0	<3.0
Total Organic Carbon	mgC/l	8	No abnormal change	0	0	0.5	1.3	2.0
Total PAHs	µg/l	8	0.1	0	0	0.000	0.000	0.001
Total Trihalomethanes	µg/l	8	100	0	0	3.65	23.19	48.37
1, 2 dichloroethane	µg/l	8	3	0	0	<0.1	<0.1	<0.1

Notes

PCV = Prescribed Concentration or Value or Specification Concentration or Value

Commentary on Water Quality

Elevated concentrations of the pesticide Metaldehyde were detected three times in 2013, in March, May and October. At these times, this zone was supplied from our North Mymms water treatment works. The raw waters that feed this treatment works have all been found to contain Metaldehyde and at present there are no known practical treatment processes that remove Metaldehyde. An Undertaking is in place for this parameter in this zone which requires Affinity Water to investigate catchment management and possible treatment solutions. The concentration detected was well below that which could affect public health.

Undertakings & Authorised Departures

No Authorised Departures applied to this water supply zone during 2013.

An Undertaking is in place for this zone relating to Metaldehyde & Total Pesticides from North Mymms Water Treatment Works (WTW) & from Anglian Water Services' (AWS) Grafham WTW. The Company has agreed to: implement a monitoring strategy; engage in catchment management activities, including support for voluntary initiatives to influence Metaldehyde use, in order to reduce concentrations in untreated waters; to engage with & provide data to relevant stakeholders; review possible alternative supply arrangements; optimise removal through current treatment processes; investigate new, sustainable treatment processes; and to continually review & appraise the risk from these hazards as part of the Regulatory process. AWS has agreed to: implement a monitoring strategy; to engage with relevant stakeholders & provide regular updates on data; investigate new, sustainable treatment processes, supporting national research programmes where appropriate; and to continually review & appraise the risk from these hazards as part of the Regulatory process.

Water Supply Zone: Borehamwood/Bushey (AF049)
Period: 01 January 2013 to 31 December 2013
Population: 83622

Parameter	Units	No. of Samples	PCV	No. of Samples >PCV	% of Samples >PCV	Min.	Mean	Max.
Microbiological Parameters								
Coliform bacteria	No./100ml	204	0	0	0	0	0	0
E coli	No./100ml	204	0	0	0	0	0	0
Clostridium perfringens	No./100ml	76	0	0	0	0	0	0
Enterococci	No./100ml	8	0	0	0	0	0	0
2 day plate count 37 °C	No./1ml at 37 °C	76	No abnormal change	0	0	0	3	62
3 day plate count 22 °C	No./1ml at 22 °C	76	No abnormal change	0	0	0	7	154
Customer Parameters								
Alkalinity	mgHCO_3/l	1	No PCV	0	0	321	321	321
Calcium	mgCa/l	1	No PCV	0	0	141	141	141
Chlorine (Residual)	mgCl_2/l	204	No PCV	0	0	0.08	0.26	0.54
Colour	mg/l Pt/Co	38	20	0	0	<1.0	<1.0	2.1
Fluoride	mgF/l	8	1.5	0	0	0.107	0.131	0.145
Hardness (Total)	mg$CaCO_3$/l	1	No PCV	0	0	353	353	353
Hydrogen Ion (pH)	pH value	76	6.5-9.5	0	0	7.0	7.1	7.3
Quantitative Odour	Dilution No.	38	Abnormal & unacceptable to	0	0	0	0	0
Quantitative Taste	Dilution No.	38	consumers	0	0	0	0	0
Temperature	°C	197	No PCV	0	0	6.5	13.0	22.8
Turbidity	NTU	76	4	0	0	0.04	0.12	0.29
Chemicals								
Metals								
Arsenic	µgAs/l	8	10	0	0	<1.0	<1.0	<1.0
Aluminium	µgAl/l	76	200	0	0	<5.0	<5.0	12.7
Antimony	µgSb/l	8	5	0	0	<0.20	<0.20	0.22
Cadmium	µgCd/l	8	5	0	0	<0.20	<0.20	<0.20
Chromium	µgCr/l	8	50	0	0	<2.0	<2.0	<2.0
Copper	mgCu/l	8	2	0	0	<0.010	0.015	0.038
Iron	µgFe/l	76	200	0	0	<15.0	<15.0	17.0
Lead	µgPb/l	8	25	0	0	<1.00	2.54	8.00
Manganese	µgMn/l	76	50	0	0	<1.0	<1.0	<1.0
Mercury	µgHg/l	8	1	0	0	<0.10	<0.10	<0.10
Nickel	µgNi/l	8	20	0	0	2.6	3.2	5.4
Sodium	mgNa/l	8	200	0	0	31.9	33.9	35.3

Parameter	Units	No. of Samples	PCV	No. of Samples >PCV	% of Samples >PCV	Min.	Mean	Max.
Pesticides								
Atrazine	µg/l	8	0.1	0	0	0.023	0.030	0.036
Bentazone	µg/l	8	0.1	0	0	<0.008	<0.008	<0.008
Bromacil	µg/l	8	0.1	0	0	<0.010	<0.010	<0.010
Carbetamide	µg/l	8	0.1	0	0	<0.008	0.011	0.047
Chlorotoluron	µg/l	8	0.1	0	0	<0.005	<0.007	<0.007
Clopyralid	µg/l	8	0.1	0	0	<0.008	<0.012	<0.012
Cyanazine	µg/l	8	0.1	0	0	<0.007	<0.007	<0.007
Dicamba	µg/l	8	0.1	0	0	<0.007	<0.011	<0.011
Dichlobenil	µg/l	8	0.1	0	0	<0.006	<0.006	<0.006
Dichlorprop	µg/l	8	0.1	0	0	<0.008	<0.008	<0.008
Diuron	µg/l	8	0.1	0	0	<0.006	<0.009	<0.009
Fenpropimorph	µg/l	8	0.1	0	0	<0.009	<0.009	<0.009
Fluroxypyr	µg/l	8	0.1	0	0	<0.008	<0.008	<0.008
Flutriafol	µg/l	8	0.1	0	0	<0.009	<0.009	<0.009
Isoproturon	µg/l	8	0.1	0	0	<0.004	<0.006	<0.006
Linuron	µg/l	8	0.1	0	0	<0.008	<0.009	<0.009
MCPA	µg/l	8	0.1	0	0	<0.008	<0.008	<0.008
MCPB	µg/l	8	0.1	0	0	<0.008	<0.010	<0.010
Mecoprop	µg/l	8	0.1	0	0	<0.008	<0.008	<0.008
Metaldehyde	µg/l	8	0.1	0	0	<0.012	0.021	0.039
Propyzamide	µg/l	8	0.1	0	0	<0.005	<0.006	<0.006
Simazine	µg/l	8	0.1	0	0	<0.008	0.010	0.014
Terbutryn	µg/l	8	0.1	0	0	<0.005	<0.009	<0.009
Total Pesticide	µg/l	8	0.5	0	0	0.053	0.085	0.113
Tri-allate	µg/l	8	0.1	0	0	<0.004	<0.009	<0.009
Trietazine	µg/l	8	0.1	0	0	<0.006	<0.008	<0.008
2,4-D	µg/l	8	0.1	0	0	<0.008	<0.008	<0.008
Additional Parameters								
Ammonium	mgNH_4/l	38	0.5	0	0	<0.04	<0.04	<0.04
Benzene	µg/l	8	1	0	0	<0.02	<0.02	<0.02
Benzo (a) Pyrene	µg/l	8	0.01	0	0	<0.001	<0.001	<0.001
Boron	mgB/l	8	1	0	0	<0.100	<0.100	0.100
Bromate	µgBrO_3/l	8	10	0	0	<0.5	<0.5	0.9
Chloride	mgCl/l	8	250	0	0	54	56	59

Parameter	Units	No. of Samples	PCV	No. of Samples >PCV	% of Samples >PCV	Min.	Mean	Max.
Additional Parameters (continued)								
Electrical Conductivity at 20 °C	µS/cm at 20 °C	76	2500	0	0	592	742	794
Nitrate	$mgNO_3/l$	8	50	0	0	28.2	30.0	31.4
Nitrite	$mgNO_2/l$	8	0.5	0	0	<0.008	<0.008	<0.008
Nitrite Nitrate Formula		8	1	0	0	<0.56	<0.63	<0.63
Selenium	µgSe/l	8	10	0	0	<1.0	1.2	1.7
Sulphate	$mgSO_4/l$	8	250	0	0	52	54	58
Sum of Tri & Tetrachloroethene	µg/l	8	10	0	0	1.7	2.3	3.3
Tetrachloromethane	µg/l	8	3	0	0	<0.1	<0.1	<0.1
Total Cyanide	µgCN/l	8	50	0	0	<3.0	<3.0	<3.0
Total Organic Carbon	mgC/l	8	No abnormal change	0	0	1.2	1.4	1.7
Total PAHs	µg/l	8	0.1	0	0	0.000	0.000	0.000
Total Trihalomethanes	µg/l	8	100	0	0	10.14	15.71	22.98
1, 2 dichloroethane	µg/l	8	3	0	0	<0.1	<0.1	<0.1

Notes

PCV = Prescribed Concentration or Value or Specification Concentration or Value

Commentary on Water Quality

Water quality was satisfactory in this zone in 2013.

Undertakings & Authorised Departures

No Undertakings or Authorised Departures applied to this water supply zone during 2013.

Water Supply Zone: Barnet (AF050)
Period: 01 January 2013 to 31 December 2013
Population: 46214

Parameter	Units	No. of Samples	PCV	No. of Samples >PCV	% of Samples >PCV	Min.	Mean	Max.
Microbiological Parameters								
Coliform bacteria	No./100ml	120	0	0	0	0	0	0
E coli	No./100ml	120	0	0	0	0	0	0
Clostridium perfringens	No./100ml	18	0	0	0	0	0	0
Enterococci	No./100ml	8	0	0	0	0	0	0
2 day plate count 37 °C	No./1ml at 37 °C	36	No abnormal change	0	0	0	7	204
3 day plate count 22 °C	No./1ml at 22 °C	36	No abnormal change	0	0	0	1	12
Customer Parameters								
Alkalinity	mgHCO_3/l	1	No PCV	0	0	259	259	259
Calcium	mgCa/l	1	No PCV	0	0	111	111	111
Chlorine (Residual)	mgCl_2/l	120	No PCV	0	0	0.09	0.28	0.69
Colour	mg/l Pt/Co	18	20	0	0	<1.0	<1.0	1.6
Fluoride	mgF/l	8	1.5	0	0	0.104	0.130	0.143
Hardness (Total)	mg$CaCO_3$/l	1	No PCV	0	0	278	278	278
Hydrogen Ion (pH)	pH value	36	6.5-9.5	0	0	7.0	7.2	7.5
Quantitative Odour	Dilution No.	18	Abnormal & unacceptable to	0	0	0	0	0
Quantitative Taste	Dilution No.	18	consumers	0	0	0	0	0
Temperature	°C	116	No PCV	0	0	7.2	13.3	21.4
Turbidity	NTU	36	4	0	0	0.06	0.15	0.36
Chemicals								
Metals								
Arsenic	µgAs/l	8	10	0	0	<1.0	<1.0	<1.0
Aluminium	µgAl/l	36	200	0	0	<5.0	18.1	41.6
Antimony	µgSb/l	8	5	0	0	<0.20	<0.20	0.22
Cadmium	µgCd/l	8	5	0	0	<0.20	<0.20	<0.20
Chromium	µgCr/l	8	50	0	0	<2.0	<2.0	<2.0
Copper	mgCu/l	8	2	0	0	<0.010	0.063	0.162
Iron	µgFe/l	36	200	0	0	<15.0	<15.0	16.3
Lead	µgPb/l	8	25	0	0	<1.00	1.47	5.74
Manganese	µgMn/l	36	50	0	0	<1.0	<1.0	3.1
Mercury	µgHg/l	8	1	0	0	<0.10	<0.10	<0.10
Nickel	µgNi/l	8	20	0	0	<2.0	<2.0	2.8
Sodium	mgNa/l	8	200	0	0	21.1	27.4	34.0

Parameter	Units	No. of Samples	PCV	No. of Samples >PCV	% of Samples >PCV	Min.	Mean	Max.
Pesticides								
Atrazine	µg/l	8	0.1	0	0	0.005	0.011	0.031
Bentazone	µg/l	8	0.1	0	0	<0.008	<0.008	<0.008
Carbendazim	µg/l	8	0.1	0	0	<0.005	<0.009	<0.009
Carbetamide	µg/l	8	0.1	0	0	<0.008	<0.009	<0.009
Chlorotoluron	µg/l	8	0.1	0	0	<0.005	<0.007	<0.007
Clopyralid	µg/l	8	0.1	0	0	<0.008	<0.012	<0.012
Cyanazine	µg/l	8	0.1	0	0	<0.007	<0.007	<0.007
Dicamba	µg/l	8	0.1	0	0	<0.007	<0.011	<0.011
Dichlobenil	µg/l	8	0.1	0	0	<0.006	<0.006	<0.006
Dichlorprop	µg/l	8	0.1	0	0	<0.008	<0.008	<0.008
Diuron	µg/l	8	0.1	0	0	<0.006	<0.009	<0.009
Fluroxypyr	µg/l	8	0.1	0	0	<0.008	<0.008	<0.008
Glyphosate	µg/l	8	0.1	0	0	<0.002	<0.003	<0.003
Isoproturon	µg/l	8	0.1	0	0	<0.004	<0.006	<0.006
Linuron	µg/l	8	0.1	0	0	<0.008	<0.009	<0.009
MCPA	µg/l	8	0.1	0	0	<0.008	<0.008	<0.008
MCPB	µg/l	8	0.1	0	0	<0.008	<0.010	<0.010
Mecoprop	µg/l	8	0.1	0	0	<0.008	<0.008	0.011
Metaldehyde	µg/l	8	0.1	0	0	0.011	0.031	0.058
Metazachlor	µg/l	8	0.1	0	0	<0.005	<0.008	<0.008
Methabenzthiazuron	µg/l	8	0.1	0	0	<0.005	<0.009	<0.009
Prometryn	µg/l	8	0.1	0	0	<0.003	<0.008	<0.008
Propyzamide	µg/l	8	0.1	0	0	<0.005	<0.006	<0.006
Simazine	µg/l	8	0.1	0	0	<0.004	<0.008	0.011
Terbutryn	µg/l	8	0.1	0	0	<0.005	<0.009	<0.009
Total Pesticide	µg/l	8	0.5	0	0	0.032	0.066	0.135
Tri-allate	µg/l	8	0.1	0	0	<0.004	<0.009	<0.009
Trietazine	µg/l	8	0.1	0	0	<0.006	<0.008	<0.008
2,4-D	µg/l	8	0.1	0	0	<0.008	<0.008	0.011
Additional Parameters								
Ammonium	mgNH_4/l	18	0.5	0	0	<0.04	<0.04	<0.04
Benzene	µg/l	8	1	0	0	<0.02	<0.02	<0.02
Benzo (a) Pyrene	µg/l	8	0.01	0	0	<0.001	<0.001	0.001
Boron	mgB/l	8	1	0	0	<0.100	<0.100	<0.100

Parameter	Units	No. of Samples	PCV	No. of Samples >PCV	% of Samples >PCV	Min.	Mean	Max.
Additional Parameters (continued)								
Bromate	µgBrO_3/l	8	10	0	0	<0.5	0.8	2.7
Chloride	mgCl/l	8	250	0	0	38	46	53
Electrical Conductivity at 20 °C	µS/cm at 20 °C	36	2500	0	0	569	642	736
Nitrate	mgNO_3/l	8	50	0	0	22.2	25.6	28.5
Nitrite	mgNO_2/l	8	0.5	0	0	<0.008	<0.008	<0.008
Nitrite Nitrate Formula		8	1	0	0	<0.44	<0.57	<0.57
Selenium	µgSe/l	8	10	0	0	<1.0	<1.0	<1.0
Sulphate	mgSO_4/l	8	250	0	0	41	48	60
Sum of Tri & Tetrachloroethene	µg/l	8	10	0	0	0.0	0.1	0.5
Tetrachloromethane	µg/l	8	3	0	0	<0.1	<0.1	<0.1
Total Cyanide	µgCN/l	8	50	0	0	<0.5	<3.0	4.0
Total Organic Carbon	mgC/l	8	No abnormal change	0	0	1.4	1.6	1.8
Total PAHs	µg/l	8	0.1	0	0	0.000	0.001	0.003
Total Trihalomethanes	µg/l	8	100	0	0	19.59	28.31	39.30
1, 2 dichloroethane	µg/l	8	3	0	0	<0.1	<0.1	<0.1

Notes

PCV = Prescribed Concentration or Value or Specification Concentration or Value

Commentary on Water Quality

Water quality was satisfactory in this zone in 2013.

Undertakings & Authorised Departures

No Authorised Departures applied to this water supply zone during 2013.

An Undertaking is in place for this zone relating to Metaldehyde & Total Pesticides from North Mymms and Iver Water Treatment Works (WTW). The Company has agreed to: implement a monitoring strategy; engage in catchment management activities, including support for voluntary initiatives to influence Metaldehyde use, in order to reduce concentrations in untreated waters; to engage with & provide data to relevant stakeholders; review possible alternative supply arrangements; optimise removal through current treatment processes; investigate new, sustainable treatment processes; and to continually review & appraise the risk from these hazards as part of the regulatory process.

Water Supply Zone: Mill Hill/Stanmore (AF052)
Period: 01 January 2013 to 31 December 2013
Population: 67028

Parameter	Units	No. of Samples	PCV	No. of Samples >PCV	% of Samples >PCV	Min.	Mean	Max.
Microbiological Parameters								
Coliform bacteria	No./100ml	180	0	0	0	0	0	0
E coli	No./100ml	180	0	0	0	0	0	0
Clostridium perfringens	No./100ml	26	0	0	0	0	0	0
Enterococci	No./100ml	8	0	0	0	0	0	0
2 day plate count 37 °C	No./1ml at 37 °C	52	No abnormal change	0	0	0	5	117
3 day plate count 22 °C	No./1ml at 22 °C	52	No abnormal change	0	0	0	8	173
Customer Parameters								
Alkalinity	mgHCO_3/l	1	No PCV	0	0	326	326	326
Calcium	mgCa/l	1	No PCV	0	0	144	144	144
Chlorine (Residual)	mgCl_2/l	180	No PCV	0	0	0.11	0.27	0.64
Colour	mg/l Pt/Co	26	20	0	0	<1.0	<1.0	2.6
Fluoride	mgF/l	8	1.5	0	0	0.117	0.132	0.146
Hardness (Total)	mg$CaCO_3$/l	1	No PCV	0	0	360	360	360
Hydrogen Ion (pH)	pH value	52	6.5-9.5	0	0	6.9	7.1	7.3
Quantitative Odour	Dilution No.	26	Abnormal & unacceptable to	0	0	0	0	0
Quantitative Taste	Dilution No.	26	consumers	0	0	0	0	0
Temperature	°C	173	No PCV	0	0	7.3	13.1	21.0
Turbidity	NTU	52	4	0	0	0.05	0.14	0.47
Chemicals								
Metals								
Arsenic	µgAs/l	8	10	0	0	<1.0	<1.0	<1.0
Aluminium	µgAl/l	52	200	0	0	<5.0	<5.0	24.4
Antimony	µgSb/l	8	5	0	0	<0.20	<0.20	0.23
Cadmium	µgCd/l	8	5	0	0	<0.20	<0.20	<0.20
Chromium	µgCr/l	8	50	0	0	<2.0	<2.0	<2.0
Copper	mgCu/l	8	2	0	0	<0.010	0.032	0.130
Iron	µgFe/l	52	200	0	0	<15.0	<15.0	90.5
Lead	µgPb/l	8	25	0	0	<1.00	3.15	7.39
Manganese	µgMn/l	52	50	0	0	<1.0	<1.0	3.4
Mercury	µgHg/l	8	1	0	0	<0.10	<0.10	<0.10
Nickel	µgNi/l	8	20	0	0	2.5	2.9	3.5
Sodium	mgNa/l	8	200	0	0	31.8	33.9	35.0

Parameter	Units	No. of Samples	PCV	No. of Samples >PCV	% of Samples >PCV	Min.	Mean	Max.
Pesticides								
Atrazine	µg/l	8	0.1	0	0	0.023	0.029	0.038
Bentazone	µg/l	8	0.1	0	0	<0.008	<0.008	<0.008
Bromacil	µg/l	8	0.1	0	0	<0.010	<0.010	<0.010
Carbetamide	µg/l	8	0.1	0	0	<0.008	0.009	0.051
Chlorotoluron	µg/l	8	0.1	0	0	<0.005	<0.007	<0.007
Clopyralid	µg/l	8	0.1	0	0	<0.008	<0.012	<0.012
Cyanazine	µg/l	8	0.1	0	0	<0.007	<0.007	<0.007
Dicamba	µg/l	8	0.1	0	0	<0.007	<0.011	<0.011
Dichlobenil	µg/l	8	0.1	0	0	<0.006	<0.006	<0.006
Dichlorprop	µg/l	8	0.1	0	0	<0.008	<0.008	<0.008
Diuron	µg/l	8	0.1	0	0	<0.006	<0.009	<0.009
Fenpropimorph	µg/l	8	0.1	0	0	<0.009	<0.009	<0.009
Fluroxypyr	µg/l	8	0.1	0	0	<0.008	<0.008	<0.008
Flutriafol	µg/l	8	0.1	0	0	<0.009	<0.009	<0.009
Isoproturon	µg/l	8	0.1	0	0	<0.004	<0.006	<0.006
Linuron	µg/l	8	0.1	0	0	<0.008	<0.009	<0.009
MCPA	µg/l	8	0.1	0	0	<0.008	<0.008	<0.008
MCPB	µg/l	8	0.1	0	0	<0.008	<0.010	<0.010
Mecoprop	µg/l	8	0.1	0	0	<0.008	<0.008	<0.008
Metaldehyde	µg/l	8	0.1	0	0	0.016	0.022	0.036
Propyzamide	µg/l	8	0.1	0	0	<0.005	<0.006	<0.006
Simazine	µg/l	8	0.1	0	0	<0.008	0.009	0.012
Terbutryn	µg/l	8	0.1	0	0	<0.005	<0.009	<0.009
Total Pesticide	µg/l	7	0.5	0	0	0.016	0.078	0.137
Tri-allate	µg/l	8	0.1	0	0	<0.004	<0.009	<0.009
Trietazine	µg/l	8	0.1	0	0	<0.006	<0.008	<0.008
2,4-D	µg/l	8	0.1	0	0	<0.008	<0.008	<0.008
Additional Parameters								
Ammonium	mgNH_4/l	26	0.5	0	0	<0.04	<0.04	0.12
Benzene	µg/l	8	1	0	0	<0.02	<0.02	<0.02
Benzo (a) Pyrene	µg/l	8	0.01	0	0	<0.001	<0.001	0.001
Boron	mgB/l	8	1	0	0	<0.100	<0.100	<0.100
Bromate	µgBrO_3/l	8	10	0	0	<0.5	<0.5	<0.5
Chloride	mgCl/l	8	250	0	0	53	56	60

Parameter	Units	No. of Samples	PCV	No. of Samples >PCV	% of Samples >PCV	Min.	Mean	Max.
Additional Parameters (continued)								
Electrical Conductivity at 20 °C	µS/cm at 20 °C	52	2500	0	0	605	734	775
Nitrate	$mgNO_3/l$	8	50	0	0	28.3	30.0	31.1
Nitrite	$mgNO_2/l$	8	0.5	0	0	<0.008	<0.008	<0.008
Nitrite Nitrate Formula		8	1	0	0	<0.57	<0.62	<0.62
Selenium	µgSe/l	8	10	0	0	1.0	1.4	2.0
Sulphate	$mgSO_4/l$	8	250	0	0	53	54	58
Sum of Tri & Tetrachloroethene	µg/l	8	10	0	0	1.8	2.3	3.3
Tetrachloromethane	µg/l	8	3	0	0	<0.1	<0.1	<0.1
Total Cyanide	µgCN/l	8	50	0	0	<3.0	<3.0	5.1
Total Organic Carbon	mgC/l	8	No abnormal change	0	0	1.2	1.5	1.8
Total PAHs	µg/l	8	0.1	0	0	0.000	0.001	0.005
Total Trihalomethanes	µg/l	8	100	0	0	11.82	16.69	21.21
1, 2 dichloroethane	µg/l	8	3	0	0	<0.1	<0.1	<0.1

Notes

PCV = Prescribed Concentration or Value or Specification Concentration or Value

Commentary on Water Quality

Water quality was satisfactory in this zone in 2013.

Undertakings & Authorised Departures

No Undertakings or Authorised Departures applied to this water supply zone during 2013.

Water Supply Zone: Shenley (AF072)
Period: 01 January 2013 to 31 December 2013
Population: 3928

Parameter	Units	No. of Samples	PCV	No. of Samples >PCV	% of Samples >PCV	Min.	Mean	Max.
Microbiological Parameters								
Coliform bacteria	No./100ml	12	0	0	0	0	0	0
E coli	No./100ml	12	0	0	0	0	0	0
Clostridium perfringens	No./100ml	4	0	0	0	0	0	0
Enterococci	No./100ml	4	0	0	0	0	0	0
2 day plate count 37 °C	No./1ml at 37 °C	4	No abnormal change	0	0	0	3	10
3 day plate count 22 °C	No./1ml at 22 °C	4	No abnormal change	0	0	0	7	28
Customer Parameters								
Alkalinity	mgHCO_3/l	1	No PCV	0	0	275	275	275
Calcium	mgCa/l	1	No PCV	0	0	122	122	122
Chlorine (Residual)	mgCl_2/l	12	No PCV	0	0	0.14	0.30	0.73
Colour	mg/l Pt/Co	2	20	0	0	<1.0	<1.0	<1.0
Fluoride	mgF/l	4	1.5	0	0	0.118	0.127	0.134
Hardness (Total)	mg$CaCO_3$/l	1	No PCV	0	0	305	305	305
Hydrogen Ion (pH)	pH value	4	6.5-9.5	0	0	6.9	7.0	7.1
Quantitative Odour	Dilution No.	2	Abnormal & unacceptable to	0	0	0	0	0
Quantitative Taste	Dilution No.	2	consumers	0	0	0	0	0
Temperature	°C	12	No PCV	0	0	8.6	13.1	20.5
Turbidity	NTU	4	4	0	0	0.06	0.14	0.19
Chemicals								
Metals								
Arsenic	µgAs/l	4	10	0	0	<1.0	<1.0	<1.0
Aluminium	µgAl/l	4	200	0	0	<5.0	<5.0	10.5
Antimony	µgSb/l	4	5	0	0	<0.20	<0.20	0.20
Cadmium	µgCd/l	4	5	0	0	<0.20	<0.20	<0.20
Chromium	µgCr/l	4	50	0	0	<2.0	<2.0	<2.0
Copper	mgCu/l	4	2	0	0	<0.010	0.010	0.030
Iron	µgFe/l	4	200	0	0	<15.0	<15.0	<15.0
Lead	µgPb/l	4	25	0	0	<1.00	<1.00	<1.00
Manganese	µgMn/l	4	50	0	0	<1.0	<1.0	<1.0
Mercury	µgHg/l	4	1	0	0	<0.10	<0.10	<0.10
Nickel	µgNi/l	4	20	0	0	<2.0	2.2	3.1
Sodium	mgNa/l	4	200	0	0	13.5	29.0	35.4

Parameter	Units	No. of Samples	PCV	No. of Samples >PCV	% of Samples >PCV	Min.	Mean	Max.
Pesticides								
Atrazine	µg/l	4	0.1	0	0	<0.007	0.023	0.032
Bentazone	µg/l	4	0.1	0	0	<0.008	<0.008	<0.008
Carbetamide	µg/l	4	0.1	0	0	<0.008	0.012	0.037
Chlorotoluron	µg/l	4	0.1	0	0	<0.005	<0.007	<0.007
Clopyralid	µg/l	4	0.1	0	0	<0.008	<0.008	<0.008
Cyanazine	µg/l	4	0.1	0	0	<0.007	<0.007	<0.007
Dicamba	µg/l	4	0.1	0	0	<0.007	<0.007	<0.007
Dichlorprop	µg/l	4	0.1	0	0	<0.008	<0.008	<0.008
Diuron	µg/l	4	0.1	0	0	<0.006	<0.009	<0.009
Fluroxypyr	µg/l	4	0.1	0	0	<0.008	<0.008	<0.008
Isoproturon	µg/l	4	0.1	0	0	<0.004	<0.006	<0.006
Linuron	µg/l	4	0.1	0	0	<0.008	<0.009	<0.009
MCPA	µg/l	4	0.1	0	0	<0.008	<0.008	<0.008
MCPB	µg/l	4	0.1	0	0	<0.008	<0.008	<0.008
Mecoprop	µg/l	4	0.1	0	0	<0.008	<0.008	<0.008
Methabenzthiazuron	µg/l	4	0.1	0	0	<0.005	<0.009	<0.009
Propazine	µg/l	4	0.1	0	0	<0.004	<0.007	<0.007
Simazine	µg/l	4	0.1	0	0	<0.008	<0.008	0.012
Terbutryn	µg/l	4	0.1	0	0	<0.005	<0.009	<0.009
Total Pesticide	µg/l	4	0.5	0	0	0.000	0.042	0.078
Trietazine	µg/l	4	0.1	0	0	<0.006	<0.008	<0.008
2,4-D	µg/l	4	0.1	0	0	<0.008	<0.008	<0.008
Additional Parameters								
Ammonium	mgNH_4/l	2	0.5	0	0	<0.04	<0.04	<0.04
Benzene	µg/l	4	1	0	0	<0.02	<0.02	<0.02
Benzo (a) Pyrene	µg/l	4	0.01	0	0	<0.001	<0.001	<0.001
Boron	mgB/l	4	1	0	0	<0.100	<0.100	0.120
Bromate	µgBrO_3/l	4	10	0	0	<0.5	<0.5	<0.5
Chloride	mgCl/l	4	250	0	0	27	48	57
Electrical Conductivity at 20 °C	µS/cm at 20 °C	4	2500	0	0	571	709	780
Nitrate	mgNO_3/l	4	50	0	0	19.6	27.2	30.1
Nitrite	mgNO_2/l	4	0.5	0	0	<0.008	<0.008	<0.008
Nitrite Nitrate Formula		4	1	0	0	<0.39	<0.60	<0.60
Selenium	µgSe/l	4	10	0	0	<1.0	1.3	2.2

Parameter	Units	No. of Samples	PCV	No. of Samples >PCV	% of Samples >PCV	Min.	Mean	Max.
Additional Parameters (continued)								
Sulphate	$mgSO_4/l$	4	250	0	0	51	53	55
Sum of Tri & Tetrachloroethene	µg/l	4	10	0	0	0.0	1.6	2.6
Tetrachloromethane	µg/l	4	3	0	0	<0.1	<0.1	<0.1
Total Cyanide	µgCN/l	4	50	0	0	<3.0	<3.0	<3.0
Total Organic Carbon	mgC/l	4	No abnormal change	0	0	0.9	1.2	1.4
Total PAHs	µg/l	4	0.1	0	0	0.000	0.000	0.000
Total Trihalomethanes	µg/l	4	100	0	0	3.62	14.54	19.50
1, 2 dichloroethane	µg/l	4	3	0	0	<0.1	<0.1	<0.1

Notes
PCV = Prescribed Concentration or Value or Specification Concentration or Value

Commentary on Water Quality
Water quality was satisfactory in this zone in 2013.

Undertakings & Authorised Departures
No Undertakings or Authorised Departures applied to this water supply zone during 2013.