SCOTTISH WATER

Annual Water Quality Report 2008

SCOTTISH WATER

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Foreword

I am pleased to present Scottish Water's Annual Water Quality Report for 2008, my first water quality report as Chief Executive Officer.

This report is produced in accordance with the requirements of The Water Supply (Water Quality) (Scotland) Regulations 2001.

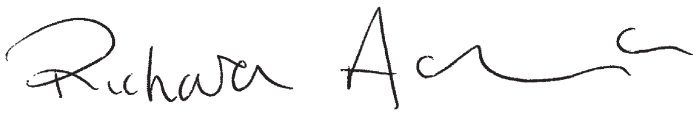
Overall water quality in Scotland continues to be of a very high standard. Throughout 2008, we conducted over 341,938 laboratory analyses on regulatory samples taken at treatment works, service reservoirs and customer taps. Of these, 99.81% were compliant with the stringent regulatory standards. In addition to regulatory monitoring, many more samples were analysed both in the laboratory and on-site for operational reasons providing additional checks and monitoring performance of our assets.

We are committed to providing high quality drinking water to all our customers, thus playing a vital role in the protection of public health.

In 2008 we continued to deliver our capital investment programme to replace, refurbish or improve 187 treatment works before 2010. Within our programme a significant part of the investment is to improve the aesthetic (colour, taste & odour) quality of water at customers' taps, reflecting the fact that tap water should not only be wholesome, but also pleasant to drink.

While we produce high quality water for our customers, there are occasions when water quality does not meet the high standards we expect. Going forward I want to minimise the occurrence of events that can lead to water quality failures. As part of this I see drinking water safety plans as an important risk management tool for ensuring that water supplies are managed to prevent failure and meet the standards required at all times. These plans will also provide vital information in the development of future investment plans.

I hope you will find this report interesting and informative and that it demonstrates that Scottish Water is delivering clearer, fresher drinking water.



Richard Ackroyd
Chief Executive
Scottish Water

Introduction

Scottish Water was created in 2002 and is the fourth largest water services provider in the UK.

In 2008 we served a population of 4.89 million. On average our household customers use approximately 864 million litres of water per day (Ml/d) and we supply approximately 464Ml/d to the non-household sector. We are continuing to provide a very high standard of water quality as demonstrated by our year on year performance.

We had 294 operational water treatment works in 2008, with by far the largest number being located in the North West of Scotland, where they are sized to supply relatively small populations. Many of these treatment works were designed and built long before higher national and European Directive water quality standards came into force.

In 2008 we continued to deliver the Quality & Standards IIIa investment programme (2006–2010), the second biggest in the UK. This programme is driven not only by legislative standards but also by the aesthetic quality (colour, taste and odour) of the water at customers' taps. The programme includes £514 million investment at 187 water treatment works and a further £64 million to maintain performance at key water assets such as pumping stations and storage tanks. Further investment in the water mains networks of £34 million is planned to reduce complaints from customers with respect to iron and manganese (sources of discolouration).

Completion of this investment, will further improve the quality of water for our customers.

We have reached the final stages of planning for the 2010–2014 investment programme, which will target additional investment in areas where water quality is not up to standard. We continue to work closely with the Drinking Water Quality Regulator for Scotland (DWQR) and health professionals to ensure water quality is of the highest possible standard and that public health is maintained.

Water Supply Assets and Supply Zones

During 2008, we had the following assets and supply zones in service and regularly monitored as part of the overall water quality sampling programme.

Sampling Location	Number
Water Treatment Works	294
Service Reservoirs	1,075
Water Supply Zones	344

Overview to Water Quality in Scotland

The water quality data included in this report represents sampling and analysis carried out under the Water Supply (Water Quality) (Scotland) Regulations 2001 (the Regulations). These Regulations came in to full effect on 25th December 2003.

The quality of our drinking water supplies is carefully assessed by thorough monitoring of the supply system, using a wide range of analytical techniques. This provides quality assurance from source to the customers' taps. The analytical data produced and our operational practices are independently checked and audited annually by the DWQR. Samples taken as part of the mandatory programme are analysed at our in-house laboratories. The full laboratory and sampling organisation, structure and processes are also audited by the United Kingdom Accreditation Service (UKAS) and the DWQR to assess compliance with the ISO 17025 standard and the Drinking Water Testing Specification (DWTS).

During the reporting year, 341,938 tests were carried out on water samples taken from water treatment works, service reservoirs and customers' taps for microbiological, physical and chemical parameters. From these tests, the overall compliance with microbiological and chemical standards was 99.81%. This represents a continuation of the high standards in overall compliance achieved since the establishment of Scottish Water in 2002.

Full details of the quality of water supplied during 2008 are supplied in Appendices A and B.

Customers can obtain detailed water quality information from Regional Offices in Inverness, Dundee, Edinburgh and Glasgow or by contacting our Customer Helpline on 0845 601 8855.

Sampling and Analysis

Compliance with the statutory sampling programme remained high in 2008 at 99.16%. Targeted investment at our sample points has contributed to this high level of compliance and work is planned to further improve the overall performance. We have introduced new procedures to capture any sampling issues arising at sites and this will ensure that solutions are implemented timeously leading to even higher compliance with the sampling programme going forward.

A new laboratory in Inverness was established in 2008 and is now processing routine microbiology samples and Cryptosporidium samples along with some basic chemistry parameters. Our investment in this facility enhances service provision in the Highlands. The Inverness laboratory fully participates in the group quality management system and is accredited to ISO 17025 and DWTS by UKAS.

Information Submission

Throughout 2008, we continued to supply monthly electronic information submissions to the DWQR which identified our assets, the water sampling we have undertaken at those assets, and corresponding sample results. This data enables the DWQR to carry out independent detailed analysis of our performance.

We supply the DWQR with laboratory and customer service data in a single submission, ensuring that the DWQR is provided with consistent and fully reconcilable information that is used in our daily operational activities.

Not withstanding this we are striving to improve on success of these systems through the continuous enhancement of the reporting tools, on-going review of the processes and the integration of our asset inventory with the laboratory systems.

Cryptosporidium

In addition to the Regulations, The Cryptosporidium (Scottish Water) Directions 2003 (the Directions) issued by Scottish Ministers outline duties and responsibilities to minimise the risk of Cryptosporidium in water supplies.

In 2008, we achieved 98.20% compliance (93.84% in 2007) against the statutory Cryptosporidium sampling requirements as determined by the risk assessment process detailed in the Directions. In doing so we collected and analysed over 16,000 samples. We continue to make improvements to achieve 100% compliance with the sampling requirements.

During 2008, we embedded procedures such as membrane integrity testing and annual Cryptosporidium training of our staff and continued with our programme of borehole inspections using CCTV, inspecting 64 individual boreholes in 2008.

Scottish Water is committed to full compliance with The Directions. We continue to ensure that processes and procedures are complied with and that appropriate interventions are put in place to improve compliance further.

Water Quality Summary

Microbiological Quality

Microbiological standards apply to water leaving treatment works, in service reservoirs and supplied at customers' taps:

(a) water leaving treatment works

In 2008, 31,487 samples were taken for faecal coliforms and 31,488 samples were taken for total coliform analysis. Compliance with the faecal coliform standard was 99.97% (99.97% in 2007) and with the total coliform standard was 99.76% (99.90% in 2007).

(b) water in service reservoirs

In 2008, 55,134 samples were taken for faecal coliforms and 55,136 were taken for total coliform analysis. Compliance with the faecal coliform standard was 99.98% (99.97% in 2007) and the total coliform standard was 99.75% (99.77% in 2007).

(c) water at customers' taps

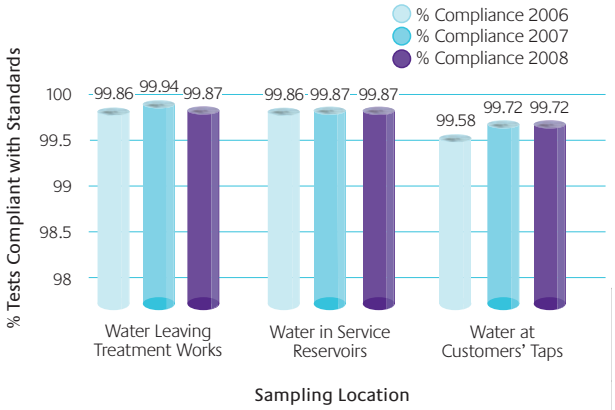
In 2008, 14,468 samples were taken for faecal coliforms and total coliform analysis. Compliance with the faecal coliform standard was 99.99% (99.97% in 2007) and the total coliform standard was 99.45% (99.46% in 2007).

While compliance with the total coliform standard remained high there has been a small deterioration in quality, compared with the very high performance in 2007. Several factors, including raw water quality and sample point issues, have contributed to this minor deterioration and we continue to examine all the data to understand what improvements can be made.

1,693 samples were taken for Enterococci analysis. Compliance with the Enterococci standard was 99.94% (99.94% in 2007).

5,269 samples were taken for *Clostridium perfringens* analysis. Compliance with the *C. perfringens* standard was 99.94% (99.96% in 2007).

Chart 1: Microbiological Water Quality % Tests Compliant with Standards (Average of Faecal and Total Coliform compliance)



Physical and Chemical Quality

Physical and chemical quality standards apply to water supplied at customers' taps. 121,517 tests were carried out at customers' taps for all parameters during 2008. Of these, 99.75% were compliant with regulatory standards (99.76% in 2007).

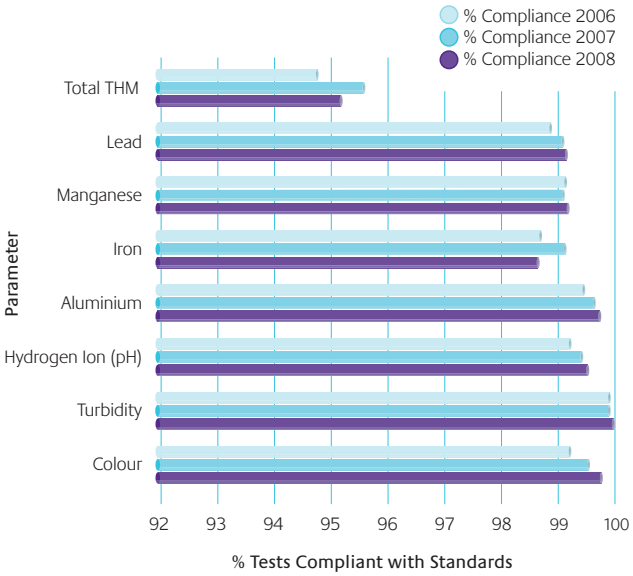
Compliance rates for the 8 key physical and chemical parameters in samples taken at customers' taps in 2008 are tabulated below, together with 2006 and 2007 for comparison.

Parameter	No. of tests in 2008	Compliance 2008	Compliance 2007	Compliance 2006
Colour	5,304	99.72%	99.48%	99.15%
Turbidity	5,305	100.00%	99.98%	99.93%
Hydrogen ion (pH)	5,303	99.49%	99.39%	99.17%
Aluminium	5,271	99.75%	99.70%	99.48%
Iron	5,271	98.67%	99.07%	98.70%
Manganese	5,271	99.22%	99.16%	99.20%
Lead	1,694	99.17%	99.14%	98.93%
Total THM	1,684	95.19%	95.57%	94.75%
Total	35,103	99.26%	99.25%	99.03%

Water Quality Summary *continued*

Compliance with 6 of the key parameters has improved when compared to 2006 and 2007 compliance levels. This demonstrates that investment in assets and improvements in operational procedures have been successful in improving water quality for customers. In particular, improvements in colour, manganese and turbidity compliance levels indicate that our customers are receiving a more aesthetically pleasing water supply. In contrast, another aesthetic parameter, iron, has shown a small dip in performance during 2008 compared with 2007. Improving iron compliance is one of the main targets of the £34 million being invested in the distribution network specifically to address water quality issues. Additionally, completion of the current investment programme on a number of key water treatment works will improve compliance with the THM standard, which also showed a small dip in 2008 performance.

Chart 2: Water at Customers' Taps Physical & Chemical Water Quality % Compliance with Standards



In addition to measuring physical and chemical quality at customers' taps we are required to monitor specific parameters, namely turbidity and nitrite, leaving treatment works.

The compliance rates for these parameters are tabulated below:

Parameter	No. of tests 2008	Compliance 2008	Compliance 2007	Compliance 2006
Turbidity*	8,250	99.60%	99.17%	99.10%
Nitrite**	3,028	99.90%	99.91%	99.70%

*Standard of 1 NTU applies at treatment works as opposed to 4 NTU at customers' taps

** Standard for nitrite at treatment works is 0.1 $mgNO_2/l$ as opposed to 0.5 $mgNO_2/l$ at customers' taps

The minor reduction in percentage compliance for nitrite between 2007 and 2008 is as a result of fewer samples taken due to asset rationalisation. The number of exceedances in both years was 3.

Capital Investment to Improve Water Quality

In 2008 we continued to deliver the Q&SIIIa investment programme.

Investment in the 2006–2010 period has been targeted at water treatment works, treated water storage tanks, water pumping stations and in the distribution system.

The programme is delivering £514 million investment at 187 water treatment works and a further £64 million to maintain performance at key water assets such as pumping stations and storage tanks. Further investment in the mains networks of £34 million is planned to reduce complaints from customers with respect to iron and manganese (sources of discolouration).

Work at water treatment works included commencement of the new works to serve parts of Midlothian and Edinburgh. This multi-million pound scheme will improve the quality of water supplied to the capital as well as supporting growth in and around the city. Extensive consultation with stakeholders including Midlothian Council, the City of Edinburgh Council, environmental groups and the public has taken place to assure the success of this scheme.

As well as this, work was completed on 40 schemes serving approximately 400,000 people to improve water quality compliance including aesthetic qualities such as taste and odour. These schemes include those at Greenock, Rosebery and Carron Valley water treatment works.

In the distribution system, key projects in Ayrshire have been completed to improve the iron and manganese aesthetic quality of water for customers. Throughout Scotland a large number of additional projects have been completed in 2008 or are underway to manage these aesthetic parameters.

In addition, work has continued to build the investment programme for the 2010–2014 business plan. A key emphasis in this period will be to install appropriate treatment at 44 sites to protect customers from the risks associated with Cryptosporidium.

Drinking Water Safety Plans

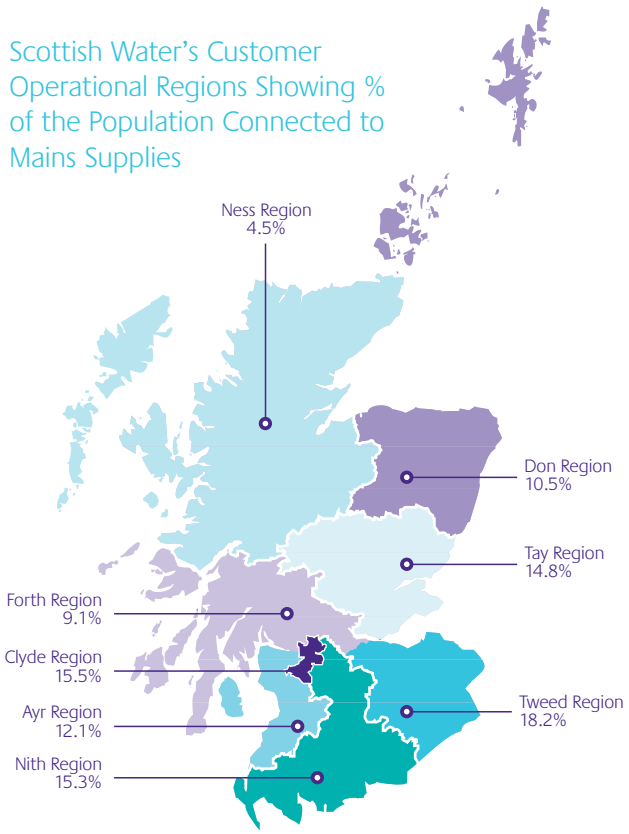
Drinking Water Safety Plans (DWSP), are an effective way of ensuring that a water supply is safe for human consumption and that it meets the health based standards and other regulatory requirements in a sustainable manner. A DWSP is based on a site specific risk assessment and management approach to all the steps in the water supply chain, from source to tap. The process facilitates the minimisation of contamination of source waters, the reduction or removal of contamination through treatment processes and the prevention of contamination during storage, distribution and handling of drinking water. In early 2008 we continued to develop and refine the DWSP process and successfully completed our 2007/08 regulatory target to have plans in place for a total of 38 public water supplies, covering 26% of the population.

During the latter part of 2008 progress continued towards completion of our 2008/09 regulatory target to have a total of 93 DWSP completed, covering over 46% of the population. In order to deal with the increased production additional tools were developed to improve the efficiency of this process including standardisation of water supply system schematics. Each DWSP also incorporates an improvement plan which is used to track risk mitigation progress.

Water Quality Analysis

The quality of the water supply in Scotland tends to reflect the geographical diversity of the country. During 2008 we operated as 8 operational regions – Ness, Don, Forth, Tay, Ayr, Clyde, Nith and Tweed.

Scottish Water's Customer Operational Regions Showing % of the Population Connected to Mains Supplies



The Ness operational region contains by far the largest number of water treatment works. The great majority of these treatment works are sized to supply relatively small populations.

Larger, high output treatment works are used to supply the main centres of population and are therefore mainly concentrated in the central belt and north east.

In addition, we have a diminishing number of small rural works, which were designed and built long before higher national and European Directive water quality standards came into force. They include supplies without colour or organics removal stages. Similarly they have inadequate or non-existent filtration barriers. When examining the distribution of water quality failures, these factors should be taken into account. Risks associated with inadequate treatment will be addressed in the future through the drinking water safety planning process and further capital investment.

Microbiological Parameters

Coliform organisms are present in large numbers in the intestine of all warm-blooded animals, but are also widely distributed in the environment. They are used as indicators of the integrity of the water supply system. Coliforms can also be present in domestic plumbing systems, with kitchen taps and sinks recognised as often being contaminated by these organisms. The *E.coli* or faecal coliform organism is a coliform bacteria and has historically been regarded as the primary indicator of faecal contamination of both untreated and treated water. *E.coli* is present in the intestine of all warm-blooded animals.

The presence of coliforms or *E.coli* in water supplies can be as a result of sub-optimal operation of water treatment processes or ingress contamination from breaches in the integrity of the distribution system. It is important that the integrity and effectiveness of disinfection systems at our treatment works and within our distribution systems is maintained. To ensure this, the levels of residual disinfectant leaving treatment works and in the distribution system are closely monitored. In total 100,906 samples were taken and analysed.

Samples Taken for Residual Disinfectant

Sampling Location	Number of Samples Taken for Residual Disinfectant*
Water leaving Treatment Works	31,406
Water in Service Reservoirs	55,065
Water at Customers' Taps	14,435

* There is no regulatory standard for residual disinfectant

Treatment Works

Coliform failures

76 failures were reported from a total of 31,488 samples. The breakdown of failures by operational area is as follows:

Operational Area	No. of WTWs	No. of failures	Percentage of overall failures
Ness	117	28	36.8%
Don	44	16	21.1%
Forth	50	10	13.2%
Tay	16	7	9.2%
Ayr	14	0	0.0%
Clyde	6	1	1.3%
Nith	24	7	9.2%
Tweed	23	7	9.2%
Total	**294**	**76**	**100%**

E. Coli failures

10 failures were reported from a total of 31,487 samples.

Operational Area	No. of WTWs	No. of failures	Percentage of overall failures
Ness	117	5	50.0%
Don	44	1	10.0%
Forth	50	2	20.0%
Tay	16	1	10.0%
Ayr	14	0	0.0%
Clyde	6	0	0.0%
Nith	24	0	0.0%
Tweed	23	1	10.0%
Total	**294**	**10**	**100%**

Service Reservoirs

Coliforms failures

137 coliform failures were reported from a total of 55,136 samples.

Operational Area	No. of SRs	No. of failures	Percentage of overall failures
Ness	227	29	21.2%
Don	224	34	24.8%
Forth	137	22	16.1%
Tay	179	30	21.9%
Ayr	68	4	2.9%
Clyde	27	2	1.5%
Nith	117	7	5.1%
Tweed	96	9	6.6%
Total	**1,075**	**137**	**100%**

E. Coli failures

11 failures were reported from a total of 55,134 samples.

Operational Area	No. of SRs	No. of failures	Percentage of overall failures
Ness	227	4	36.3%
Don	224	2	18.2%
Forth	137	0	0.0%
Tay	179	1	9.1%
Ayr	68	1	9.1%
Clyde	27	1	9.1%
Nith	117	0	0.0%
Tweed	96	2	18.2%
Total	**1,075**	**11**	**100%**

Customers' Taps

Coliform failures

79 failures were reported from a total of 14,468 samples.

Operational Area	No. of Zones	No. of failures	Percentage of overall failures
Ness	117	7	8.9%
Don	49	18	22.8%
Forth	55	3	3.8%
Tay	18	16	20.1%
Ayr	17	4	5.1%
Clyde	18	2	2.5%
Nith	38	19	24.1%
Tweed	32	10	12.7%
Total	**344**	**79**	**100%**

***E. Coli* failures**

2 failures were reported from a total of 14,468 samples.

Operational Area	No. of Zones	No. of failures	Percentage of overall failures
Ness	117	1	50.0%
Don	49	0	0.0%
Forth	55	0	0.0%
Tay	18	1	50.0%
Ayr	17	0	0.0%
Clyde	18	0	0.0%
Nith	38	0	0.0%
Tweed	32	0	0.0%
Total	**344**	**2**	**100%**

Physico-chemical Parameters

Physico-chemical parameters are monitored at customers' taps. In addition, turbidity and nitrite samples are taken at treatment works.

Treatment Works

Nitrite failures:

3 failures were reported from 3,028 samples.

Operational Area	No. of WTWs	No. of failures	Percentage of overall failures
Ness	117	0	0.0%
Don	44	0	0.0%
Forth	50	1	33.3%
Tay	16	1	33.3%
Ayr	14	0	0.0%
Clyde	6	0	0.0%
Nith	24	0	0.0%
Tweed	23	1	33.3%
Total	**294**	**3**	**100%**

Turbidity failures:

33 failures were reported from 8,250 samples.

Operational Area	No. of WTWs	No. of failures	Percentage of overall failures
Ness	117	2	6.1%
Don	44	12	36.4%
Forth	50	3	9.1%
Tay	16	8	24.2%
Ayr	14	2	6.1%
Clyde	6	2	6.1%
Nith	24	2	6.1%
Tweed	23	2	6.1%
Total	**294**	**33**	**100%**

Customers' Taps

Colour

15 failures of the colour standard were reported in 2008, from a total of 5,304 samples.

Colour in water supplies is normally due to the presence of coloured organic acids (humic and fulvic) derived from peat and soil humus, when they are not adequately removed during the water treatment process.

Operational Area	No. of Zones	No. of failures	Percentage of overall failures
Ness	117	11	73.3%
Don	49	1	6.7%
Forth	55	0	0.0%
Tay	18	1	6.7%
Ayr	17	0	0.0%
Clyde	18	0	0.0%
Nith	38	1	6.7%
Tweed	32	1	6.7%
Total	**344**	**15**	**100%**

In the Ness operational region, the failures were recorded in small supply zones. This is largely due to the minimal level of treatment on some of these rural supplies and the variable nature of raw water quality. Improvements to existing processes and the introduction of membrane based water treatment systems to smaller supplies are helping to reduce failures of the colour standard.

The remaining fails were all single one off samples from 4 treatment works, one of which is no longer in use and another, Alnwickhill in Tweed, has had work completed to minimise colour through the treatment process.

Overall 96% of supply zones were fully compliant with the colour standard (20 mg/l Pt/Co).

Iron

70 failures of the iron standard were reported in 2008, from a total of 5,271 samples.

Iron occurs naturally in many raw waters. In addition corrosion of old cast iron mains in the distribution network can contribute to iron in customers' supplies. The iron standard is set for aesthetic reasons and levels above the standard can give rise to discolouration and particles in the water.

Operational Area	No. of Zones	No. of failures	Percentage of overall failures
Ness	117	4	5.7%
Don	49	15	21.4%
Forth	55	4	5.7%
Tay	18	8	11.4%
Ayr	17	13	18.6%
Clyde	18	8	11.4%
Nith	38	11	15.7%
Tweed	32	7	10.0%
Total	**344**	**70**	**100%**

The presence of iron in water at customers' taps can be attributed to the accumulation of residual amounts not removed by the water treatment process or corrosion of old cast iron mains in the distribution network. These deposits are dealt with by scouring and relining in the distribution system.

During 2008 we have carried out investigations in 84 water supply zones to inform planners working on our investment programme for 2010–14. The aesthetic parameter iron is a key part of these investigations.

Overall 86% of supply zones were fully compliant with the iron standard (200 µg Fe/l).

Manganese

41 failures of the manganese standard were reported in 2008, from a total of 5,271 samples.

Manganese occurs naturally in many raw waters and concentrations can vary seasonally. Like iron, the manganese standard is set for aesthetic reasons and to prevent unpleasant tastes.

Operational Area	No. of Zones	No. of failures	Percentage of overall failures
Ness	117	3	7.3%
Don	49	2	4.9%
Forth	55	5	12.2%
Tay	18	3	7.3%
Ayr	17	20	48.8%
Clyde	18	2	4.9%
Nith	38	5	12.2%
Tweed	32	1	2.4%
Total	**344**	**41**	**100%**

The presence of manganese in water at customers' taps can be attributed to the accumulation of residual amounts not removed by the water treatment process. These deposits are dealt with by scouring and relining in the distribution system and the introduction of manganese removal stages in water treatment processes aimed at preventing their creation in the first place. 13 of the failures experienced occurred in the Bradan water supply zone in the Ayr operational region. Significant investment is taking place to remove manganese through the treatment process at Bradan water treatment works. Extensive remedial work to deal with deposits in the network has also commenced and will continue into the next investment period.

Overall 93% of supply zones were fully compliant with the manganese standard (50 µg Mn/l).

Total THM

81 failures of the Trihalomethanes (THM) standard were reported in 2008, from a total of 1,684 samples.

THM are formed by the reaction of chlorine with naturally occurring organic compounds in the water.

Operational Area	No. of Zones	No. of failures	Percentage of overall failures
Ness	117	39	48.1%
Don	49	7	8.6%
Forth	55	4	4.9%
Tay	18	0	0.0%
Ayr	17	6	7.4%
Clyde	18	0	0.0%
Nith	38	22	27.2%
Tweed	32	3	3.7%
Total	**344**	**81**	**100%**

A high percentage of Scottish Water's supplies are derived from upland sources containing significant levels of these organic compounds and consequently THM is a parameter subject to a high number of exceedances.

THM formation can be minimised by removing as much of the organic material as possible prior to chlorination. Introduction of chloramination as a means of disinfection also reduces the potential for THM formation. Reduction of THM levels is a major driver for our current investment programme. The number of failures is expected to reduce significantly following the completion of some key projects during 2009.

Overall 88% of supply zones were fully compliant with the THM standard (100 µg/l).

Lead

14 failures of the 25 µg Pb/l lead standard were reported in 2008, from a total of 1,694 samples.

The existence of lead at customers' taps is largely attributable to elements of lead pipework within customer properties or the connections to our network.

Overall 96% of supply zones were fully compliant with the lead standard (25 µg Pb/l).

Water leaving treatment works is stabilised in order to minimise its tendency to dissolve the lead pipework. Dosing of phosphate compounds to reduce plumbosolvency is being extended to more treatment works. Lead pipe replacement is also currently undertaken as part of the ongoing mains rehabilitation programme or in small zones where it proves to be more cost effective than dosing.

We are working to reduce the occurrence of lead in customers' supplies as part of the ongoing investment programme, but customers remain responsible for replacing any lead pipe that still exists in their property.

Aluminium

13 failures of the aluminium standard were reported in 2008, from a total of 5,271 samples.

Aluminium compounds occur naturally in soils and are also used as coagulants to remove colour and impurities from the raw water. The coagulated material is subsequently removed prior to the water entering supply. Contraventions of the aluminium standard are generally due to failures of these processes.

Ongoing work to optimise existing processes along with the investment in new treatment works and enhancing control systems at existing works aims to minimise these failures.

Overall 97% of supply zones were fully compliant with the aluminium standard (200 µg Al/l).

Authorised Departures and Enforcement Notices

Authorised Departures

Authorised Departures may be required for any parameters that do not comply with the standards laid down in the Regulations. Departures are required for water supply zones which have one or more parameters with recurring failures of the standard.

We are required to apply for an Authorised Departure to Scottish Ministers. In support of the application we must submit analytical data to quantify the extent of the problem and provide a detailed outline of the steps to be taken to secure compliance with the Regulations. An important part of the process is that we must give a commitment to a date when compliance will be secured. The maximum time period permitted under the Regulations for an Authorised Departure is 3 years (although a further departure may be permitted by Ministers if the problem cannot be rectified in this period). Authorised Departures will not be granted where there could be a potential danger to public health.

Copies of the applications are submitted to the Water Industry Commission for Scotland (the Commission), Waterwatch Scotland, the local Consultant in Public Health Medicine (CPHM) and the local authority (via Environmental Health departments) in the affected area. These parties have 30 days to make any representation to Scottish Ministers. Once a Departure has been granted Scottish Water must inform the population affected that a Departure from the Regulations has been granted and the conditions governing it.

Within the notification of the Departure the following information is provided:

- Parameters failing to meet regulatory standards and the permitted maximum exceedance for the duration of the Departure
- All water supply zones affected
- Measures to be taken to rectify the problem (e.g. new treatment works)
- Timescale to rectify the problem

The method of notification depends on the size of the population affected. Small populations, 100 properties or less are notified by letter. For larger populations Scottish water takes out a local press advert.

The table opposite lists the Authorised Departures that were in place at any time during 2008. The list includes all Authorised departures granted, amended or that expired during 2008. Details of Authorised Departures can also be viewed on our website (www.scottishwater.co.uk in the publications section. Alternatively details can be obtained by contacting our Customer Helpline on 0845 601 8855.

Appendix C shows water quality compliance with Authorised Departure limits in place in 2008.

During 2008 significant investment was completed to close Barclye and Palnure water treatment works and supply customers from Penwhirn WTW. Customers will be benefiting from improved water quality with respect to colour as Penwhirn WTW provides a significantly more robust treatment process than either Barclye or Palnure. However, due to raw water quality Penwhirn WTW also produces water into supply that has exceedances of the disinfection by-product, Trihalomethanes. As part of the current investment programme there is a project to resolve this issue and a significant improvement is expected towards the end of 2009. In February 2008 we applied for second Authorised Departures for Barclye and Penwhirn Barclye water supply zones. The DWQR has reviewed these applications and has indicated that an enforcement notice will be issued for the water quality contraventions. We are taking the appropriate steps that will allow us to comply with the terms of the enforcement notice.

Water Supply Zone	Communities within Water Supply Zone	Authorised Departure Parameters	Date Authorised Departure Granted	Authorised Departure End Date	Measures Completed by end of 2008
*Barclye (Newton Stewart)	Netwon Stewart, including: Bargrennan, Glentrool, Minnigaff, Old Minnigaff and Penninghame	Colour, Iron, THM	22/11/2004	30/09/2007	No
**Lochinver	Lochinver, Strathan, Inverkircaig, Baddidarroch, Badnaban, Cruamer and Culag	THM	22/06/2006	31/12/2008	No
Palnure	Palnure, Stornord, Bargaly, Carty, East Kirkland, West Kirkland, Carse of Clary, Carse of Barr and Glenturk	Colour, THM	22/06/2006	01/04/2009	No
*Penwhirn Barclye	Netwon Stewart, including: Creebridge, Kirkcowan, Minnigaff, Old Minnigaff, Whithorn and Wigtown	Colour, Iron, THM	22/11/2004	30/09/2007	No
Penwhirn Palnure	Wigtown	Iron, THM	22/06/2006	01/04/2009	No
Shieldaig	Shieldaig	Colour, THM	22/06/2006	01/04/2009	No
**Tarbert	Aird Asaig, Bun Abhainn Eadarra, Caolas Scalpaigh, Carrigreich, Deiraclete, Eilean na Scalpaigh, Leacainn, Miabhaig, Tairbeart and Urgha	Colour	22/06/2006	22/06/2009	No

* Scottish Water applied for a second departure. The DWQR has reviewed these applications and has indicated that an enforcement notice will be issued for the water quality contraventions.

** Scottish Water applied for a modification to the previous departure.

Enforcement Notices

The DWQR has power to issue enforcement notices under the Water Industry (Scotland) Act 2002 Section 10. The DWQR can serve an enforcement notice if he believes that Scottish Water has:–

- contravened or is contravening a drinking water quality duty;
- believes that the contravention is likely to recur or continue; and
- that Scottish Water is not taking appropriate steps to rectify the contravention or prevent it recurring.

The DWQR can, if he wishes, take advice from the local Health Authority and the local authority.

The notice must contain:

- details of the alleged contravention;
- his reasons for believing it to be a contravention;
- the date by which it is to be rectified;
- the steps he wants Scottish Water to take, including milestone dates;
- the date on which the notice takes effect. This date must be no earlier than the day following the last day on which an appeal may be brought.

Loch Eck WTW – Manganese contravention

The DWQR outlined his concern to Scottish Water regarding manganese failures in the area supplied by Loch Eck WTW early in 2007 following a WTW upgrade which was completed in September 2006. The problems appeared to be related to increased manganese present in the raw water since the works had been upgraded. The upgraded works has no manganese removal stage and soluble manganese can enter the network. Following extended communication concerning the options available, the DWQR issued an enforcement notice which came into effect on 16th October 2008.
The notice requires Scottish Water to adopt a twin track approach by making changes to the raw water abstraction by April 2009 to determine if this delivers improvements over the summer manganese season. If this is unsuccessful, Scottish Water is required to design a manganese treatment removal stage by April 2010 with construction beginning immediately thereafter. The DWQR and Scottish Water have issued press-releases and the Minister for the Environment also publicly stated that Scottish Water needs to address the manganese issues in this water supply zone.

Water Quality Incidents

We are required to notify the DWQR of failures to meet the quality standards (an event) laid down in the Regulations. The DWQR then decides whether an event is deemed serious enough to be declared as an incident.

In 2008 the DWQR deemed that 65* water quality events were serious enough to be classified as incidents. They requested further information and actions in the form of an incident report on 30* of these incidents. These are listed in the table opposite.

Inverness (Loch Ashie) WTW Water Quality Incident

On 14th June 2008, alarms from Inverness (Loch Ashie) WTW were passed to the standby operator. On arrival on site he discovered the plant to be shut down. An alarm from the acid dosing room had caused this shut down at midnight on 13th June 2008. While on-site the operator also received a telemetry communications fail alarm for the site. The operator resolved the acid alarm and re-started the plant. He remained on site until it had stabilised. At this point the communications were still in a failed condition as the operator was focussed on resolving the acid dosing fault. The site then shut down again due to a further acid alarm. The clear water tank proceeded to drain into supply and emptied on the morning of 15th June 2008. No new alarms were raised in the telemetry system due to the continued communication fail status. During a routine visit, later that day, it was discovered that the plant was shut down and the clear water tank empty.

A response team was immediately set up and at the same time our call centre started to receive calls for low pressure and no water. 1,000 calls were received by midday. The call volumes then quickly reduced, with a total of 1235 received in all. It is estimated that 4400 properties were without water for between 15 minutes and 2.5 hours. These were all properties that are supplied directly from the trunk mains.

Throughout the recovery period the incident team ensured that none of the service reservoirs in the system emptied. The trunk main gradually filled throughout the day and the level instruments started to register water in the clear water tank. Sampling was put in place for the service reservoirs and some water quality contraventions, in the form of aluminium levels, above the regulatory standard were detected until Saturday 21st June. This either came from ineffective filtration through the treatment process during the start up, or from deposition within the clear water tanks and the trunk main as water ran across the base of the tanks for approximately 12 hours. By Monday 23rd June 2008, all samples from the system were within standards. All samples taken from customer's taps during the incident complied with the regulatory standards.

As a result of this incident action has been taken to resolve the corrosive atmosphere causing the problem in the acid dosing room and the procedures in responding to communications failure alarms have been reviewed.

Amlaird WTW Water Quality Incident

The DWQR requested an incident report following high iron concentrations leaving the Amlaird WTW during August 2008. During the period of these events we received a total of 148 customer contacts. These contacts were due to discolouration caused from the high iron residuals entering the distribution system.

Since early July the works has been struggling to perform at its optimum, mainly due to difficulties with running the lime dosing system that controls chemical coagulation. This has been further aggravated by a significant deterioration in raw water quality over the summer period.

Work continues at the site to ensure that the treatment process is fully optimised. Results indicate that microbiological quality has not been compromised and iron concentrations have significantly reduced.

*Numbers correct at the time of printing

Water Quality Incident Reports Requested*

Location	Date	Population Affected	WQ Report Reason
Viewlands Mid Level SR	17/01/2008	26,394	Security breach at Service Resrvoir
Acharacle WTW	21/01/2008	344	Addition of unapproved de-chlorinating tablets to the CWT
Tomatin WTW	23/01/2008	360	Telemetry failure
Melness WTW	25/01/2008	153	Colour failure
Alligin WTW	04/02/2008	68	Failure to comply with DOMS/HCoP
Mannofield WTW	11/02/2008	284,354	Iron and manganese failure
Invercannie WTW	12/02/2008	54,279	Disinfection failure
Lumsden WTW	17/02/2008	428	Disinfection failure
Laggan Bridge WTW	19/02/2008	59	Disinfection failure
Durness WTW	05/04/2008	280	Disinfection failure
Kaim WTW	06/05/2008	7,532	Disinfection failure
Acharacle WTW	10/05/2008	354	Disinfection failure and issues with telemetry
New Onich WSZ	10/05/2008	663	High coliforms
New Onich WTW	22/05/2008	663	Low level CWT alarm and response delay
Sanday WTW	29/05/2008	478	Disinfection failure
Inverness WTW (Loch Ashie)	15/06/2008	68,364	High coliforms
Glendevon B RSZ	02/07/2008	750	High coliforms and DOMS/HCoP issues
Tomnavoulin WTW	04/07/2008	116	Cryptosporidium and boil water notice
Amlaird WTW	02/08/2008	34,765	Process failure and discoloured water in supply
Shieldaig WTW	11/08/2008	115	Disinfection failure
Newmore WTW	19/08/2008	13,598	Aluminium failure
Tiree WTW	27/08/2008	770	Disinfection failure and boil water notice
Non site specific	01/09/2008	0	Chemical contamination
Kirkmichael RSZ	17/10/2008	0	Failure to comply with DOMS/HCoP
South Moorhouse WTW	19/10/2008	30,412	Aluminium failure
Beasdale (new) WTW	24/10/2008	10	Telemetry failure and boil water notice
Glendye WTW	15/11/2008	13,051	Chloramination failure
Kinlochbervie WTW	11/12/2008	458	Microbiological failure
Burncrooks	12/12/2008	47,544	Coagulation failure
Kilmelford WTW	18/12/2008	100	Disinfection failure

*Correct at the time of printing.

Water Quality Undertakings

Scottish Water inherited Undertakings to Scottish Ministers in terms of Section 76 E (4) (b) of the Water (Scotland) Act 1980.

These Undertakings were given by the predecessor authorities as a commitment to secure compliance with the Regulations. The Q&S II investment programme (2002–2006) was largely driven by these Undertakings.

A table of Undertakings delivered during 2008 is included in Appendix D of this report. Of the 308 Water Quality Undertakings inherited by Scottish Water from the predecessor authorities, 282 have been delivered, leaving 26 in 22 separate water supply zones.

Appendix A

Microbiological Water Quality

Appendix A
Microbiological Water Quality

Water Leaving Treatment Works

	Total Coliforms			Faecal Coliforms		
Volume of water distributed from works (m^3/d)	No. of samples	No. of Fails	Percentage exceeding PCV	No. of samples	No. of Fails	Percentage exceeding PCV
Less than 3,000 m^3/d	10,172	41	0.40%	10,171	8	0.08%
3,000 to 12,000 m^3/d	6,094	8	0.13%	6,094	1	0.02%
More than 12,000 m^3/d	15,222	27	0.18%	15,222	1	0.01%
Totals	**31,488**	**76**	**0.24%**	**31,487**	**10**	**0.03%**

Water at Customers' Taps

	Total Coliforms			Faecal Coliforms		
Size of Zone (population)	No. of samples	No. of Fails	Percentage exceeding PCV	No. of samples	No. of Fails	Percentage exceeding PCV
Less than 5,000 people	2,109	12	0.57%	2,109	1	0.05%
5,000 to 20,000 people	1,335	4	0.30%	1,335	0	0.00%
20,001 to 100,000 people	11,024	63	0.57%	11,024	1	0.01%
Totals	**14,468**	**79**	**0.55%**	**14,468**	**2**	**0.01%**

Water in Service Reservoirs

	Total Coliforms			Faecal Coliforms		
Capacity of reservoir (m3)	No. of samples	No. of Fails	Percentage exceeding PCV	No. of samples	No. of Fails	Percentage exceeding PCV
Less than 2,000 m^3	42,622	120	0.28%	42,620	10	0.02%
2,000 – 10,000 m^3	9,576	16	0.17%	9,576	1	0.01%
More than 10,000 m^3	2,938	1	0.03%	2,938	0	0.00%
Totals	**55,136**	**137**	**0.25%**	**55,134**	**11**	**0.02%**

Water at Customers' Taps

	Enterococci			*Clostridium perfringens*		
Size Band	No. of samples	No. of Fails	Percentage exceeding PCV	No. of samples	No. of Fails	Percentage exceeding PCV
Less than 5,000 people	682	0	0.0%	745	1	0.13%
5,000 to 20,000 people	345	1	0.29%	773	1	0.13%
20,001 to 100,000 people	666	0	0.0%	3,751	1	0.03%
Totals	**1,693**	**1**	**0.06%**	**5,269**	**3**	**0.06%**

Appendix B

Physical and Chemical Water Quality at Customers' Taps

Appendix B

Physical and Chemical Water Quality at Customers' Taps

Population size	Number of Zones	No. of Results	Results Failing PCV	Results Failing PCV (%)	Zones With PCV Failures
1,2 Dichloroethane					
Less than 5,000 people	217	676	0	0.00%	0
5,000 to 20,000 people	43	343	0	0.00%	0
20,001 to 100,000 people	83	665	0	0.00%	0
Total	**343**	**1,684**	**0**	**0.00%**	**0**
2,4,-Db					
Less than 5,000 people	27	91	0	0.00%	0
5,000 to 20,000 people	25	195	0	0.00%	0
20,001 to 100,000 people	72	574	0	0.00%	0
Total	**124**	**860**	**0**	**0.00%**	**0**
2,4-D					
Less than 5,000 people	27	91	0	0.00%	0
5,000 to 20,000 people	25	195	0	0.00%	0
20,001 to 100,000 people	72	574	0	0.00%	0
Total	**124**	**860**	**0**	**0.00%**	**0**
Aldrin					
Less than 5,000 people	217	680	0	0.00%	0
5,000 to 20,000 people	43	344	0	0.00%	0
20,001 to 100,000 people	83	664	0	0.00%	0
Total	**343**	**1,688**	**0**	**0.00%**	**0**
Aluminium					
Less than 5,000 people	218	746	7	0.94%	6
5,000 to 20,000 people	43	773	3	0.39%	3
20,001 to 100,000 people	83	3,752	3	0.08%	3
Total	**344**	**5,271**	**13**	**0.25%**	**12**
Ammonium					
Less than 5,000 people	218	746	1	0.13%	1
5,000 to 20,000 people	43	772	2	0.26%	1
20,001 to 100,000 people	83	3,786	2	0.05%	2
Total	**344**	**5,304**	**5**	**0.09%**	**4**
Antimony					
Less than 5,000 people	218	680	0	0.00%	0
5,000 to 20,000 people	43	344	0	0.00%	0
20,001 to 100,000 people	83	666	1	0.15%	0
Total	**344**	**1,690**	**1**	**0.06%**	**1**
Arsenic					
Less than 5,000 people	218	679	0	0.00%	0
5,000 to 20,000 people	43	344	0	0.00%	0
20,001 to 100,000 people	83	666	0	0.00%	0
Total	**344**	**1,689**	**0**	**0.00%**	**0**
Asulam					
Less than 5,000 people	26	93	0	0.00%	0
5,000 to 20,000 people	5	40	0	0.00%	0
20,001 to 100,000 people	24	190	0	0.00%	0
Total	**55**	**323**	**0**	**0.00%**	**0**
Atrazine					
Less than 5,000 people	120	345	0	0.00%	0
5,000 to 20,000 people	7	54	0	0.00%	0
20,001 to 100,000 people	13	104	0	0.00%	0
Total	**140**	**503**	**0**	**0.00%**	**0**
Benzene					
Less than 5,000 people	217	676	0	0.00%	0
5,000 to 20,000 people	43	343	0	0.00%	0
20,001 to 100,000 people	83	665	0	0.00%	0
Total	**343**	**1,684**	**0**	**0.00%**	**0**

Population size	Number of Zones	No. of Results	Results Failing PCV	Results Failing PCV (%)	Zones With PCV Failures
Benzo (a) Pyrene					
Less than 5,000 people	218	674	1	0.15%	1
5,000 to 20,000 people	43	342	0	0.00%	0
20,001 to 100,000 people	83	666	4	0.60%	3
Total	**344**	**1,682**	**5**	**0.30%**	**4**
Boron					
Less than 5,000 people	218	682	0	0.00%	0
5,000 to 20,000 people	43	345	0	0.00%	0
20,001 to 100,000 people	83	666	0	0.00%	0
Total	**344**	**1,693**	**0**	**0.00%**	**0**
Bromate					
Less than 5,000 people	216	662	1	0.15%	1
5,000 to 20,000 people	43	339	0	0.00%	0
20,001 to 100,000 people	83	658	0	0.00%	0
Total	**342**	**1,659**	**1**	**0.06%**	**1**
Cadmium					
Less than 5,000 people	218	678	0	0.00%	0
5,000 to 20,000 people	43	344	0	0.00%	0
20,001 to 100,000 people	83	666	0	0.00%	0
Total	**344**	**1,688**	**0**	**0.00%**	**0**
Chloride					
Less than 5,000 people	218	675	2	0.30%	2
5,000 to 20,000 people	43	344	0	0.00%	0
20,001 to 100,000 people	83	666	0	0.00%	0
Total	**344**	**1,685**	**2**	**0.12%**	**2**
Chlortoluron					
Less than 5,000 people	5	20	0	0.00%	0
5,000 to 20,000 people	4	31	0	0.00%	0
20,001 to 100,000 people	31	239	0	0.00%	0
Total	**40**	**290**	**0**	**0.00%**	**0**
Chromium					
Less than 5,000 people	218	678	0	0.00%	0
5,000 to 20,000 people	43	344	0	0.00%	0
20,001 to 100,000 people	83	666	0	0.00%	0
Total	**344**	**1,688**	**0**	**0.00%**	**0**
Colour					
Less than 5,000 people	218	745	12	1.61%	10
5,000 to 20,000 people	43	772	1	0.13%	1
20,001 to 100,000 people	83	3,787	2	0.05%	2
Total	**344**	**5,304**	**15**	**0.28%**	**13**
Conductivity					
Less than 5,000 people	218	745	0	0.00%	0
5,000 to 20,000 people	43	772	0	0.00%	0
20,001 to 100,000 people	83	3,787	0	0.00%	0
Total	**344**	**5,304**	**0**	**0.00%**	**0**
Copper					
Less than 5,000 people	218	683	1	0.15%	1
5,000 to 20,000 people	43	345	0	0.00%	0
20,001 to 100,000 people	83	666	0	0.00%	0
Total	**344**	**1,694**	**1**	**0.06%**	**1**
Cyanide					
Less than 5,000 people	218	682	0	0.00%	0
5,000 to 20,000 people	43	345	0	0.00%	0
20,001 to 100,000 people	83	666	0	0.00%	0
Total	**344**	**1,693**	**0**	**0.00%**	**0**

Appendix B
Physical and Chemical Water Quality at Customers' Taps *continued*

Population size	Number of Zones	No. of Results	Results Failing PCV	Results Failing PCV (%)	Zones With PCV Failures
Cypermethrin					
Less than 5,000 people	25	87	0	0.00%	0
5,000 to 20,000 people	14	112	0	0.00%	0
20,001 to 100,000 people	52	407	0	0.00%	0
Total	**91**	**606**	**0**	**0.00%**	**0**
Diazinon					
Less than 5,000 people	169	515	0	0.00%	0
5,000 to 20,000 people	25	199	0	0.00%	0
20,001 to 100,000 people	58	456	0	0.00%	0
Total	**252**	**1,170**	**0**	**0.00%**	**0**
Dicamba					
Less than 5,000 people	27	91	0	0.00%	0
5,000 to 20,000 people	25	195	0	0.00%	0
20,001 to 100,000 people	72	574	0	0.00%	0
Total	**124**	**860**	**0**	**0.00%**	**0**
Dieldrin					
Less than 5,000 people	217	680	0	0.00%	0
5,000 to 20,000 people	43	344	0	0.00%	0
20,001 to 100,000 people	83	664	0	0.00%	0
Total	**343**	**1,688**	**0**	**0.00%**	**0**
Diuron					
Less than 5,000 people	5	20	0	0.00%	0
5,000 to 20,000 people	4	32	0	0.00%	0
20,001 to 100,000 people	31	248	0	0.00%	0
Total	**40**	**300**	**0**	**0.00%**	**0**
Flumethrin					
Less than 5,000 people	25	83	0	0.00%	0
5,000 to 20,000 people	14	108	0	0.00%	0
20,001 to 100,000 people	52	393	0	0.00%	0
Total	**91**	**584**	**0**	**0.00%**	**0**
Fluoride					
Less than 5,000 people	218	670	0	0.00%	0
5,000 to 20,000 people	43	341	0	0.00%	0
20,001 to 100,000 people	83	660	0	0.00%	0
Total	**344**	**1,671**	**0**	**0.00%**	**0**
Free Chlorine					
Less than 5,000 people	217	2,092	0	0.00%	0
5,000 to 20,000 people	43	1,330	0	0.00%	0
20,001 to 100,000 people	83	11,013	0	0.00%	0
Total	**343**	**14,435**	**0**	**0.00%**	**0**
Gamma-HCH (Lindane)					
Less than 5,000 people	163	496	0	0.00%	0
5,000 to 20,000 people	20	160	0	0.00%	0
20,001 to 100,000 people	25	201	0	0.00%	0
Total	**208**	**857**	**0**	**0.00%**	**0**
Heptachlor					
Less than 5,000 people	217	686	0	0.00%	0
5,000 to 20,000 people	43	346	0	0.00%	0
20,001 to 100,000 people	83	669	0	0.00%	0
Total	**343**	**1,701**	**0**	**0.00%**	**0**
Heptachlor epoxide					
Less than 5,000 people	217	680	0	0.00%	0
5,000 to 20,000 people	43	344	0	0.00%	0
20,001 to 100,000 people	83	664	0	0.00%	0
Total	**343**	**1,688**	**0**	**0.00%**	**0**

Population size	Number of Zones	No. of Results	Results Failing PCV	Results Failing PCV (%)	Zones With PCV Failures
Hydrogen ion (pH)					
Less than 5,000 people	218	745	17	2.28%	13
5,000 to 20,000 people	43	772	2	0.26%	2
20,001 to 100,000 people	83	3,786	8	0.21%	7
Total	**344**	**5,303**	**27**	**0.51%**	**22**
Iron					
Less than 5,000 people	218	746	12	1.61%	10
5,000 to 20,000 people	43	773	20	2.59%	12
20,001 to 100,000 people	83	3,752	38	1.01%	26
Total	**344**	**5,271**	**70**	**1.33%**	**48**
Isoproturon					
Less than 5,000 people	5	20	0	0.00%	0
5,000 to 20,000 people	4	31	0	0.00%	0
20,001 to 100,000 people	35	270	0	0.00%	0
Total	**44**	**321**	**0**	**0.00%**	**0**
Lead					
Less than 5,000 people	218	683	5	0.73%	5
5,000 to 20,000 people	43	345	5	1.45%	4
20,001 to 100,000 people	83	666	4	0.60%	4
Total	**344**	**1,694**	**14**	**0.83%**	**13**
Linuron					
Less than 5,000 people	5	20	0	0.00%	0
5,000 to 20,000 people	4	32	0	0.00%	0
20,001 to 100,000 people	31	248	0	0.00%	0
Total	**40**	**300**	**0**	**0.00%**	**0**
Manganese					
Less than 5,000 people	218	746	5	0.67%	5
5,000 to 20,000 people	43	773	8	1.03%	6
20,001 to 100,000 people	83	3,752	28	0.75%	14
Total	**344**	**5,271**	**41**	**0.78%**	**25**
MCPA					
Less than 5,000 people	27	91	0	0.00%	0
5,000 to 20,000 people	25	195	0	0.00%	0
20,001 to 100,000 people	72	574	0	0.00%	0
Total	**124**	**860**	**0**	**0.00%**	**0**
MCPB					
Less than 5,000 people	27	91	0	0.00%	0
5,000 to 20,000 people	25	195	0	0.00%	0
20,001 to 100,000 people	72	574	0	0.00%	0
Total	**124**	**860**	**0**	**0.00%**	**0**
MCPP(Mecoprop)					
Less than 5,000 people	27	91	0	0.00%	0
5,000 to 20,000 people	25	195	0	0.00%	0
20,001 to 100,000 people	72	574	0	0.00%	0
Total	**124**	**860**	**0**	**0.00%**	**0**
Mercury					
Less than 5,000 people	218	678	0	0.00%	0
5,000 to 20,000 people	43	344	0	0.00%	0
20,001 to 100,000 people	83	666	0	0.00%	0
Total	**344**	**1,688**	**0**	**0.00%**	**0**
Nickel					
Less than 5,000 people	218	678	0	0.00%	0
5,000 to 20,000 people	43	344	0	0.00%	0
20,001 to 100,000 people	83	666	0	0.00%	0
Total	344	1,688	0	0.00%	0

Appendix B

Physical and Chemical Water Quality at Customers' Taps *continued*

Population size	Number of Zones	No. of Results	Results Failing PCV	Results Failing PCV (%)	Zones With PCV Failures
Nitrate					
Less than 5,000 people	218	681	0	0.00%	0
5,000 to 20,000 people	43	452	0	0.00%	0
20,001 to 100,000 people	83	1,348	0	0.00%	0
Total	**344**	**2,481**	**0**	**0.00%**	**0**
Nitrite					
Less than 5,000 people	218	681	0	0.00%	0
5,000 to 20,000 people	43	452	4	0.88%	1
20,001 to 100,000 people	83	1,348	23	1.71%	7
Total	**344**	**2,481**	**27**	**1.09%**	**8**
Odour					
Less than 5,000 people	218	747	0	0.00%	0
5,000 to 20,000 people	43	772	0	0.00%	0
20,001 to 100,000 people	83	3,787	1	0.03%	1
Total	**344**	**5,306**	**1**	**0.02%**	**1**
PAH - Total					
Less than 5,000 people	218	674	0	0.00%	0
5,000 to 20,000 people	43	342	0	0.00%	0
20,001 to 100,000 people	83	666	1	0.15%	1
Total	**344**	**1,682**	**1**	**0.06%**	**1**
Permethrin					
Less than 5,000 people	25	87	0	0.00%	0
5,000 to 20,000 people	14	112	0	0.00%	0
20,001 to 100,000 people	52	407	0	0.00%	0
Total	**91**	**606**	**0**	**0.00%**	**0**
Pesticides - Total					
Less than 5,000 people	217	952	0	0.00%	0
5,000 to 20,000 people	43	461	0	0.00%	0
20,001 to 100,000 people	83	1,481	0	0.00%	0
Total	**343**	**2,894**	**0**	**0.00%**	**0**
Propetamphos					
Less than 5,000 people	169	515	0	0.00%	0
5,000 to 20,000 people	25	199	0	0.00%	0
20,001 to 100,000 people	58	456	0	0.00%	0
Total	**252**	**1,170**	**0**	**0.00%**	**0**
Selenium					
Less than 5,000 people	218	678	0	0.00%	0
5,000 to 20,000 people	43	344	0	0.00%	0
20,001 to 100,000 people	83	666	0	0.00%	0
Total	**344**	**1,688**	**0**	**0.00%**	**0**
Simazine					
Less than 5,000 people	120	345	0	0.00%	0
5,000 to 20,000 people	7	54	0	0.00%	0
20,001 to 100,000 people	13	104	0	0.00%	0
Total	**140**	**503**	**0**	**0.00%**	**0**
Sodium					
Less than 5,000 people	218	682	0	0.00%	0
5,000 to 20,000 people	43	345	0	0.00%	0
20,001 to 100,000 people	83	666	0	0.00%	0
Total	**344**	**1,693**	**0**	**0.00%**	**0**
Sulphate					
Less than 5,000 people	218	682	0	0.00%	0
5,000 to 20,000 people	43	345	0	0.00%	0
20,001 to 100,000 people	83	666	0	0.00%	0
Total	**344**	**1,693**	**0**	**0.00%**	**0**

Population size	Number of Zones	No. of Results	Results Failing PCV	Results Failing PCV (%)	Zones With PCV Failures
Taste					
Less than 5,000 people	218	747	0	0.00%	0
5,000 to 20,000 people	43	772	0	0.00%	0
20,001 to 100,000 people	83	3,786	1	0.03%	1
Total	**344**	**5,305**	**1**	**0.02%**	**1**
Tetrachloroethene & Trichloroethene					
Less than 5,000 people	217	676	0	0.00%	0
5,000 to 20,000 people	43	343	0	0.00%	0
20,001 to 100,000 people	83	665	0	0.00%	0
Total	**343**	**1,684**	**0**	**0.00%**	**0**
Tetrachloromethane					
Less than 5,000 people	217	676	0	0.00%	0
5,000 to 20,000 people	43	343	0	0.00%	0
20,001 to 100,000 people	83	665	0	0.00%	0
Total	**343**	**1,684**	**0**	**0.00%**	**0**
TON Ratio					
Less than 5,000 people	218	681	0	0.00%	0
5,000 to 20,000 people	43	452	0	0.00%	0
20,001 to 100,000 people	83	1,348	0	0.00%	0
Total	**344**	**2,481**	**0**	**0.00%**	**0**
Total chlorine					
Less than 5,000 people	217	2,092	0	0.00%	0
5,000 to 20,000 people	43	1,330	0	0.00%	0
20,001 to 100,000 people	83	11,013	0	0.00%	0
Total	**343**	**14,435**	**0**	**0.00%**	**0**
Total organic carbon					
Less than 5,000 people	217	678	0	0.00%	0
5,000 to 20,000 people	43	345	0	0.00%	0
20,001 to 100,000 people	83	665	0	0.00%	0
Total	**343**	**1,688**	**0**	**0.00%**	**0**
Total Trihalomethanes					
Less than 5,000 people	217	676	61	9.02%	32
5,000 to 20,000 people	43	343	16	4.66%	6
20,001 to 100,000 people	83	665	4	0.60%	2
Total	**343**	**1,684**	**81**	**4.81%**	**40**
Turbidity					
Less than 5,000 people	218	746	0	0.00%	0
5,000 to 20,000 people	43	772	0	0.00%	0
20,001 to 100,000 people	83	3,787	0	0.00%	0
Total	**344**	**5,305**	**0**	**0.00%**	**0**

Appendix C

Compliance against Authorised Departure Limits

Appendix C
Compliance against Authorised Departure Limits

Regulation Water Supply Zone	Authorised Departure Parameter	Authorised Departure Limit	Date Authorised Departure Granted	No. Samples Taken in 2008 with AD	No. Failures	Percentage Compliance
Distribution for Lochinver	THM - Total	150	22/06/2006	14	0	100%
Distribution for Palnure	Colour	22	22/06/2006	4	0	100%
Distribution for Palnure	THM - Total	150	22/06/2006	14	1	93%
Distribution for Penwhirn Palnure	Iron	360	22/06/2006	4	0	100%
Distribution for Penwhirn Palnure	THM - Total	150	22/06/2006	15	4	73%
Distribution for Shieldaig	Colour	35	22/06/2006	4	0	100%
Distribution for Shieldaig	THM - Total	170	22/06/2006	12	0	100%
Distribution for Tarbert	Colour	40*	22/06/2006	8	0	100%
Total				**75**	**5**	**93.33%**

*Scottish Water applied for and was granted a modification to increase the colour departure limit.

NB Scottish Water applied for a second departure for the Barclye (Newton Stewart) and Penwhirn Barclye water supply zones. DWQR has reviewed these applications and has indicated that an enforcement notice will be issued for the water quality contraventions. The supply zones did not have existing departures during 2008.

Appendix D

Water Quality Undertakings completed during 2008

Appendix D
Water Quality Undertakings Completed during 2008

Zone Name	Quality Parameter	Undertaking Date	Date Undertaking Delivered	Work currently complete
Bigton	THM	31-Dec-08	16/07/2008	Mained out from Lerwick
Braes	THM	31-Dec-06	04/12/2008	Mained out from Storr Forest
Elsrickle	Bact	30-Nov-02	01/07/2008	Mained out from Coulter
Glenurquhart (Coilte)	THM	31-Dec-05	03/04/2008	Mained out from Glenconvinth
Glenurquhart (Nam Bat)	Crypto	31-Dec-05	31/03/2008	Mained out from Glenconvinth
Glenurquhart (Nam Bat)	THM	31-Dec-05	31/03/2008	Mained out from Glenconvinth
Newton Stewart	Bact	25-Dec-02	01/10/2008	Mained out from Penwhirn

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