

DRINKING
WATER
QUALITY
REPORT
2004



Water
Service



INVESTOR IN PEOPLE



An Agency within the Department for

**Regional
Development**

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Foreword

This is Water Service's Annual Drinking Water Quality report covering the calendar year 2004.

As Chief Executive of Water Service, I am personally committed to improving the delivery of high quality water to our customers and I am therefore pleased to inform you that Water Service has again fully met its targets for water quality. As the ongoing major investment programme comes on-line we expect that customers will also benefit from improved water quality compliance, therefore continuing to improve the quality of water supplied to our customers in the future.

In 2004 the Water Supply (Water Quality) Regulations (NI) 2002 came into force. These regulations implement the EC Drinking Water Directive (Council Directive 98/83/EC on the quality of water intended for human consumption). They fully incorporate, and go beyond, the requirement of the Directive and introduce tighter quality standards particularly for lead and other health related parameters. They allow a time

limited authorised departure from the regulatory limit for certain parameters, provided that there is a planned programme of work at the water treatment works to improve the water quality and that there are no adverse health implications.

Water Service is undergoing major organisational changes in preparation for its new standalone status of a Government owned company. This continuing level of water quality reflects the ongoing commitment of all staff to improve the service to the customer, whilst progressing with Water Reform. This is a credit to their hard work and dedication.

During the period of the report, the new Mourne Water Treatment Works at Drumaroad came fully into service. This major works delivers 155 million litres of water per day and will greatly improve the quality of water in the area supplied. It is part of a £200 million investment programme over the next 3 years to upgrade the water treatment and distribution system throughout

Northern Ireland to meet the ever increasing demand for high quality water.

I hope you find this report informative and interesting, and that you will be assured of Water Service's commitment to maintaining and improving the quality of drinking water delivered to its customers throughout Northern Ireland.

K. Bryan

Katharine Bryan
Chief Executive



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Introduction

The Department for Regional Development is responsible under the Water and Sewerage Services (Northern Ireland) Order 1973 to supply and distribute water. Water supplied for domestic or food production purposes, must meet the standards contained in "The Water Supply (Water Quality) Regulations (Northern Ireland) 2002". The Department exercises its water supply functions through Water Service, which is an Executive Agency within the Department.

Authorised Departures (ADs) from standards in Northern Ireland are authorised and administered by the Department of the Environment's Drinking Water Inspectorate with the agreement of the Health Authorities. The standards that have been relaxed are for Aluminium and Total Trihalomethanes and apply to the water supplied to the Water Supply Zones listed in Appendix 2. These named Zones are supplied from Water Treatment Works that have an agreed fixed programme of works intended to make them fully compliant with the regulations.

Water is regularly monitored and tested for quality. This report summarises Water Service's regulatory results from 1 January 2004 to 31 December 2004. During this reporting period, 98.64% of all tests carried out on samples taken from customers' taps and authorised supply points, complied with the regulatory

standards. If Authorised Departures are included in the assessment, the compliance increases to 99.64%. Including the Authorised Departures in the compliance assessment may be regarded as indicating the likely quality of water following the completion of the above programmes of work.

Water Service aims to provide drinking water, in a cost effective manner, to meet the requirements of existing and future customers and, thereby, contribute to the health and well being of the community and the protection of the environment.

Water Service continues to meet the obligations placed upon it to comply with regulatory standards and the heightened demands from customers' expectations. Investing in the extension and upgrading of water treatment works remains a top priority and the current programme is detailed in Appendix 4.

A higher percentage of the Northern Ireland population, as compared to Great Britain, live in rural areas. As a result there is a greater length of watermain per head of population connected to the public supply. The average length of watermain per head of population served in Northern Ireland is estimated at 14.7 metres as compared to 6.2 metres in England and Wales, and 9.0 metres in Scotland. This therefore means that

Water Service's ongoing mains rehabilitation programme to restore or replace the existing water mains pipework to a proper condition is both crucial and expensive.

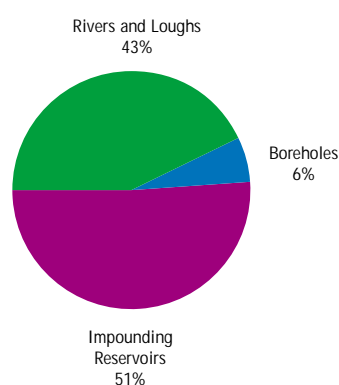
To assist in understanding the contents of this report, a glossary of technical terms is provided. (Appendix 5)

Sufficiency of Supply

Effective planning for the sufficiency of future water supplies is essential. Water Service has adopted the twin track approach to water resource planning. Demand for water is managed through leakage control and other water efficiency measures while at the same time ensuring that the provision of new sources is advanced to a state of readiness.

Water supplies in Northern Ireland are obtained from three types of supply, as shown: -

Water Supplies



Drinking Water Quality Standards

Drinking Water Quality in Northern Ireland is assessed against standards set in the Water Supply (Water Quality) Regulations (Northern Ireland) 2002.

The Water Supply (Water Quality) Regulations (Northern Ireland) 2002 (the "Regulations") fully incorporate the requirements of the European Commission's Drinking Water Directive 98/83/EC (the "Directive") relating to the quality of water intended for human consumption and, for certain parameters, more stringent UK national standards.

The Regulations set out the requirements to be met by Water Service when supplying water for domestic or food production purposes and include: -

- water quality standards for wholesomeness
- sampling locations for monitoring purposes
- minimum requirements for the number, frequency and types of water samples to be taken at sampling locations
- water sample collection and testing regimes
- maintaining records of water sample results
- provision and publication of information

Water Service assesses standards for water quality against the parameters as listed in Appendix 1. The standards in the Regulations are normally expressed as 'Prescribed Concentrations or Values' (PCV) and are generally specified as maximum, minimum, percentile or average concentrations for a particular substance. Standards are set to ensure that water is safe to drink and to make it aesthetically acceptable.

The Directive and the Regulations permit standards to be relaxed in certain specified circumstances provided there is no risk to public health under a process of "Authorised Departures". These allow a time limited Authorised Departure from the regulatory limit for certain parameters, provided there is a planned programme of work at the Water Treatment Works to improve the water quality and there are no adverse health implications

The Regulations set demanding standards for the quality of drinking water but contraventions of these standards do not

necessarily imply the water represents any public health risk. All contraventions are reported to the Drinking Water Inspectorate, followed up by Water Service, and prompt remedial action taken where appropriate.

Drinking Water Inspectorate - Technical Audit

A Drinking Water Inspectorate (the "Inspectorate"), established within the Environment and Heritage Service Agency, has an independent responsibility to audit drinking water quality compliance against the standards set in the Regulations.

Each year the Inspectorate undertakes a technical audit of the measures taken by Water Service to comply with the Regulations. The technical audit process includes:

- the transfer, to the Inspectorate, of analytical results of samples taken throughout the year, from water treatment works, service reservoirs and customers' taps
- a compliance assessment of this information against the regulatory standards
- carrying out an inspection programme which examines the sampling, analytical, reporting, water treatment, distribution policies and relevant procedures

- audit of two water treatment works (Fofanny and Killylane)
- a *Cryptosporidium* risk assessment and monitoring review
- progress on agreed follow-up action including non-trivial parameter contraventions, previous inspections and post incident analysis

The Inspectorate made a number of recommendations and observations and Water Service have followed up on these issues. The Drinking Water Inspectorate will report on the inspections and the quality of water supplied by Water Service in its annual report, due to be published later in the year. The Inspectorate is located at Commonwealth House, 35 Castle Street, Belfast BT1 1GH.

In 2004, the technical audit inspection programme included:

- evaluation and implementation of strategies to meet new regulatory requirements
- audit of two service reservoirs (Ballymageogh and Kingarow)

Incidents

In addition to Drinking Water Inspectorate's audit of drinking water quality, the Inspectorate requires to be notified whenever an incident or event occurs that has the potential to impact on drinking water quality. After investigation these may prove not to have had a detrimental effect on water quality and are classified in the Drinking Water Inspector's Report as "events" as opposed to "incidents".

During 2004, there were 4 notifiable incidents and 2 events.

Water Quality Incidents/Events

Date	Location	Nature of Incident / Event	Classification
May 2004	Castor Bay Water Treatment Works	Algal breakthrough in final water	Event
June 2004	Wood Road/Whitefort Road, Castlewellan	Chemical failures	Incident
July 2004	Heather Road/Sheriff's Road, Derry	Contamination of water main during repair - 'Boil Notice' issued	Incident
September 2004	Martello Park, Seahill, Holywood	Outside tap contaminated - 'Boil Notice' issued	Event
September 2004	Kells Primary School, Limentary Road	Contamination of water main - 'Boil Notice' issued	Incident
October 2004	Causeway End Road, Lisburn	Bacteriological failures - 'Boil Notice' issued	Incident

Monitoring Drinking Water Quality

The Regulations necessitate a thorough and extensive water sampling programme to be undertaken, to monitor water quality throughout the supply and distribution systems. The sampling locations and frequencies for the monitoring of drinking water quality are specified in the Regulations. These are audited by the Drinking Water Inspectorate (DWI). The mandatory sampling programme requires water samples to be collected regularly at water treatment works, at service reservoirs and water towers used to store treated water and at customers' taps in the water supply zones.

Under the Regulations, parameters which do not change in the supply watermain may be collected from Authorised Supply Points. These samples are collected from the final supply point of the Water Treatment Works, and are considered under the Regulations to be equivalent to samples collected from the customer tap. All samples are carefully collected, handled and transported to ensure that they accurately represent the water quality which customers receive. Water

Service employs skilled and experienced sampling staff for the collection and delivery of the regulatory samples to the laboratories. All sampling staff wear uniforms and carry identity cards when they call upon customers to take a sample.

Samples collected from customers' taps are taken randomly in each water supply zone. A water supply zone is a designated area of no more than 100,000 population supplied with water by one treatment works or blended water from several works. The number and boundaries of water supply zones are subject to change according to operational requirements, as supply sources to areas are adjusted to meet demand and infrastructure developments. On this basis 71 zones were monitored during the period of this report.

The parameters for which samples are tested include: -

- microbiological, e.g. Coliform bacteria
- physical, e.g. pH (Hydrogen Ion)
- chemical, e.g. Iron, Manganese, Lead and Nitrate

- aesthetic, e.g. Taste, Odour and Colour

Compliance with the drinking water standards is determined by comparing the results of laboratory analysis of water samples with the relevant parameter PCV. Where monitoring indicates that a standard has not been met, appropriate immediate investigation and remedial action is undertaken to ensure that the water supply does not present any public health risk. Sampling programmes are adjusted and increased testing may be scheduled in the water supply zone for the parameter involved.

Quality Assurance

The Regulations require water quality to be monitored using analytical systems which can demonstrate that appropriate accuracy is achieved and maintained.

Water Service attaches great importance to the integrity of the analysis and for this reason applies stringent laboratory analytical quality control procedures.

These systems and procedures are subject to external inspection and audit by the Drinking Water Inspectorate and an assessment of Water Service's performance will be included in the Inspectorate's annual report.

Water Service has achieved the requirements of the Drinking Water Testing Specification, a national scheme agreed between the Drinking Water Inspectorate and the United Kingdom Accreditation Service for quality assurance within laboratories carrying out analysis for the water industry.

In addition to this, all Water Service Testing Laboratories have attained the necessary standard of analytical

excellence and have been awarded UKAS accreditation. UKAS external auditors continuously monitor this accreditation.

The importance of rapid detection of *Cryptosporidium* oocysts has resulted in a *Cryptosporidium* Analytical Unit being established at the Altnagelvin Laboratory. This Unit has Drinking Water Inspectorate approval and is instrumental in the development of new accredited methods for the water industry.

Water Quality Summary

Water Service Sites in Service

During 2004, the numbers of Water Service sites in service were:

Location Type	Number in Service
Water Treatment Works	50
Service Reservoirs	359
Water Supply Zones	71
Authorised Supply Points (see glossary)	50

Overall Water Quality

114,819 microbiological, physical and chemical tests were carried out for schedule, (and zonal total coliforms) parameters on water samples taken from water treatment works, service reservoirs and customers' taps in the year 2004. 113,916 of these tests complied with the regulatory standards giving an overall compliance of 99.21%.

Microbiological Quality

Microbiological quality standards apply to water leaving water treatment works, water held in service reservoirs and water delivered to customers' taps.

Water leaving water treatment works is disinfected with chlorine to safeguard public health by destroying microorganisms. This is the most important part of the water treatment process and is monitored for effectiveness at water treatment works, service reservoirs and in the distribution system at customers' taps.

To ensure the wholesomeness of water supplied, treated water is regularly examined for total coliforms and faecal coliforms (*E. coli*). The presence of these organisms may indicate potential microbiological contamination of water supplies and if they are detected in drinking water immediate action is taken to identify the source and to minimise any risk to public health.

Many instances of microbiological failure in samples taken from customers' taps are due to contamination of the tap, particularly kitchen taps. For this reason if a positive result is obtained investigations are immediately carried out to identify if the positive result is due to the specific tap or the general system.

A summary of the microbiological quality of water supplied in 2004 is given below.

Water Leaving Treatment Works

- 9,591 samples were taken and examined for coliforms. Of these, total coliforms were absent from 99.84% of samples and (*E. coli*) from 99.92%.

Water in Service Reservoirs

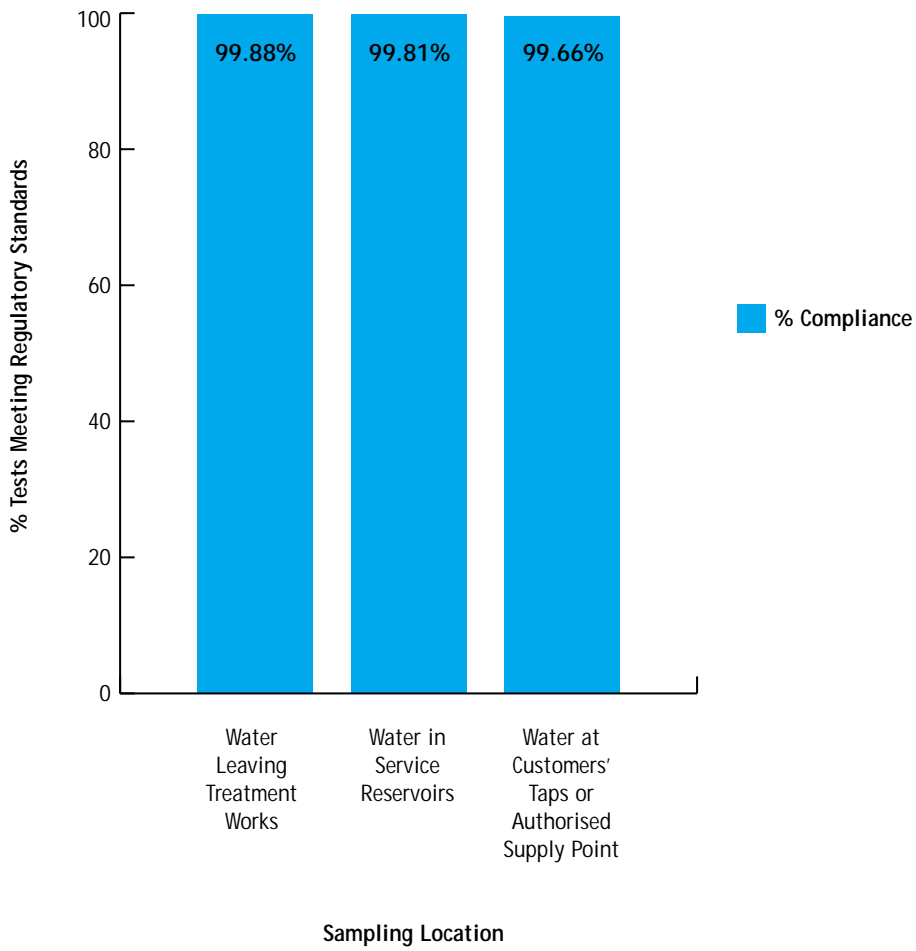
- 18,258 samples were taken and examined for coliforms. Of these, total coliforms were absent from 99.68% of samples and (*E. coli*) from 99.94%.

Water at Customers' Taps

- 5054 samples were taken from customers' taps and examined for coliforms. Of these, total coliforms were absent from 99.35% of samples and *E. coli* from 99.94% of samples. 506 samples were taken from customers' taps and examined for *Enterococci*, and of these *Enterococci* was absent from all samples.

Microbiological Water Quality

% Tests meeting Regulatory Standards

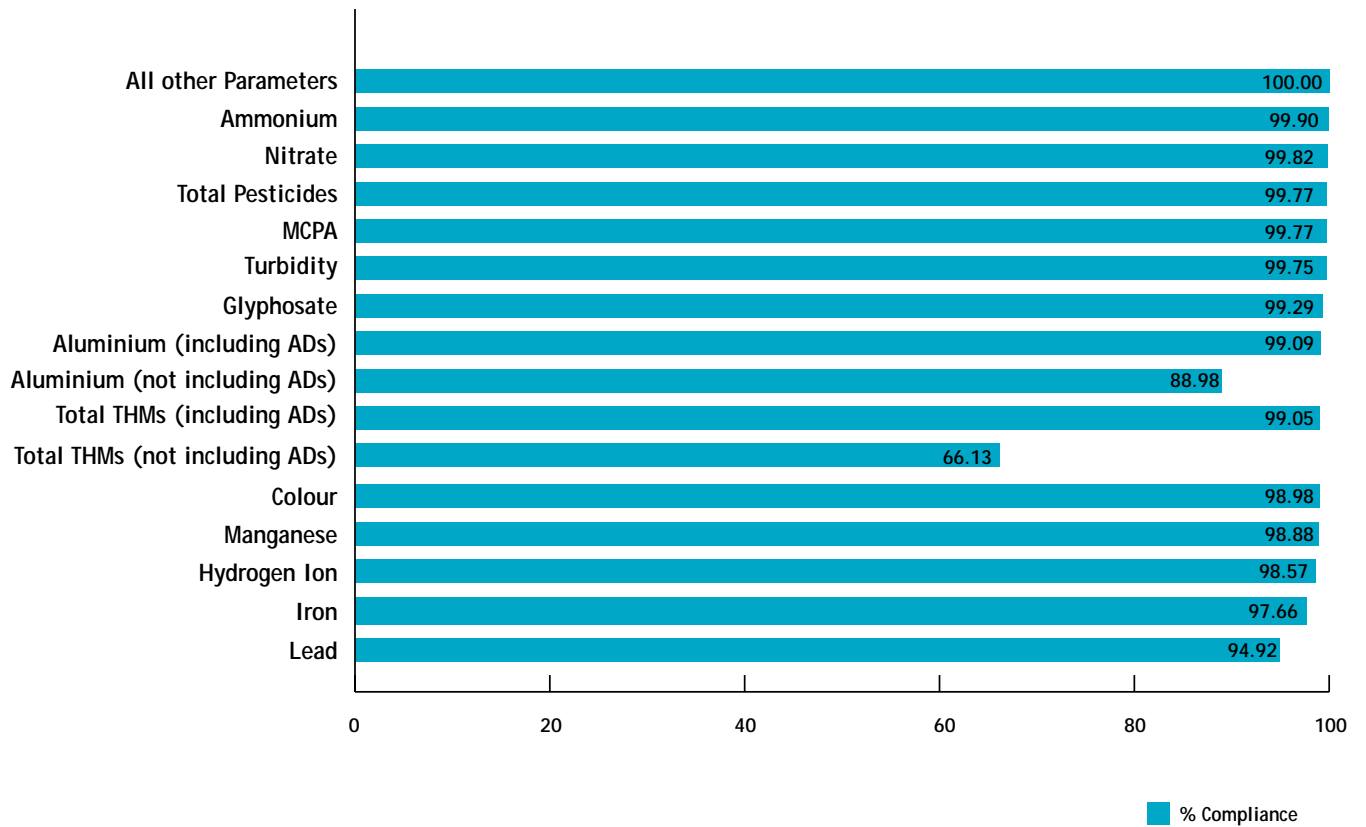


Overall Water Quality

	Number of Analytical Tests	Number of Tests Exceeding PCV	% Compliance with Regulatory Standards	Number of Tests Exceeding PCV or Authorised Departures	% Compliance with Regulatory Standards including Authorised Departures
<i>Water Leaving Treatment Works</i>					
Total coliform	9591	15	99.84	15	99.84
<i>E. coli</i>	9590	8	99.92	8	99.92
Microbiological Total	19181	23	99.88	23	99.88
Nitrite	858	12	98.60	12	98.60
Total	20039	35	99.83	35	99.83
<i>Water in Service Reservoirs</i>					
Total coliform	18258	59	99.68	59	99.68
<i>E. coli</i>	18258	11	99.94	11	99.94
Total	36516	70	99.81	70	99.81
<i>Water at Customers' Taps or Authorised Supply Points</i>					
Total coliform	5054	26	99.49	26	99.49
<i>E. coli</i>	5054	10	99.80	10	99.80
<i>Enterococci</i>	506	0	100.00	0	100.00
Microbiological Total	10614	36	99.66	36	99.66
Zone Chemical Analysis	24335	760	96.88	173	99.29
Supply Point Chemical Analysis	23315	5	99.98	5	99.98
Total	58264	801	98.63	214	99.63
Overall Water Quality Total	114819	906	99.21	319	99.72

Physical and Chemical Water Quality at Customer Tap or Authorised Supply Point

% of tests meeting Regulatory Standard



Physical and Chemical Quality

Physical and chemical quality standards apply to water supplied at customers' taps. The Regulations lay down the required sampling frequency for each parameter or group of parameters dependent on the resident population of the water supply zones. 47,650 tests were carried out on the physical and chemical parameters listed in Schedule 1 of Appendix 1 in 2004, and of these 46,893 complied with the regulatory standards, giving a compliance of 98.41%. If Authorised Departures are included in the assessment, the compliance increases to 99.63%. Including the Authorised Departures in the compliance assessment may be regarded as indicating the likely quality of water following the completion of the planned programmes of work at water treatment works.

Appendix 3 shows the extent of Water Service's compliance with the regulatory standards at both customer tap and authorised supply point. For most parameters, compliance is judged on the basis of the results of individual samples. If a single sample exceeds the PCV, that supply is deemed not to comply with the regulatory standards, even if the cause is outside Water Service's control, e.g. defective plumbing within premises. Improved compliance will be achieved through the water treatment works investment programme and thereafter through improvements to the distribution system.

In 2004 a total of 46,893 physical and chemical parameters analysed for, achieved 100% compliance. Explanatory notes of exceedences of the physical and chemical quality standards with less than 100% compliance are provided in the following section.

Water Quality Issues

Total Trihalomethanes (THMs)

THMs are chlorination by-products arising from the reaction of chlorine, used for disinfection, with natural organic material present in water. The maintenance of microbiological quality (and hence the use of chlorine) is Water Service's main priority. Northern Ireland waters are predominantly drawn from surface sources, which can contain these organic materials.

The water treatment works investment programme is designed to reduce organic matter prior to chlorination and thereby reduce Trihalomethane levels. Improved compliance is expected, as improvements to water treatment works and distribution system are completed. This includes the completion this year of the new Mourne Water Treatment Works at Drumaroad. This major works delivers 155 million litres of water per day and will greatly improve the quality of water in the area supplied. The addition of ozonation to the treatment processes at Dunore Point WTW (and shortly at Castor Bay WTW) will also improve the expected compliance for Trihalomethanes.

Time limited Authorised Departures for THMs are in place in many of the Water Supply Zones which exceeded the THM regulatory PCV level. During the period of the report, there were 4 exceedences of the Authorised Departure level in these zones, the rest falling within the agreed authorised limits.

In the interim until the programmes of work are completed Water Service is: -

- using where practicable monochloramine as an alternative disinfectant
- continually reviewing its operational procedures with the aim of reducing THM levels in the distribution system, whilst maintaining microbiological quality

Aluminium

Aluminium can be present in water supplies as a natural constituent due to the nature and structure of the ground from which the supplies are taken. Water supply zones served from the Silent Valley source in the Mourne Mountains have naturally occurring

aluminium in their water supplies and the new treatment facilities at Drumaroad will lower these levels to below the regulatory standard.

Aluminium compounds are used at some water treatment works as coagulants, for the removal of suspended matter and impurities. The coagulant is subsequently removed, along with the impurities, before the water leaves the treatment works.

The standard set for aluminium is based on aesthetic considerations. A number of water supplies may contain concentrations of aluminium which could exceed the standard from time to time because of changes in raw water quality or treatment process fluctuations. These treatment processes are being reviewed and modified to lower the levels to below regulatory levels.

Time limited Authorised Departures for aluminium are in place in many of the Water Supply Zones which exceeded the aluminium regulatory PCV level. During the period of the report, there were 12

exceedences of the Authorised Departure level in these zones, the rest falling within the agreed authorised limits.

Iron

The iron standard has been set for aesthetic reasons as levels persistently above the standard can give rise to discoloured water and occurrence of particles. Where the standard for iron has not been met, this may be due to problems of corrosion of cast iron watermains. There is an ongoing programme of scouring and cleaning of the distribution system to minimise the problem. In addition, Water Service have an ongoing Water Mains Rehabilitation Programme in which supply zones which experience water quality and other supply problems are subjected to a Detailed Zonal Study. These Detailed Zonal Studies include the analysis of historic water quality data (including iron) and the implementation of targeted water sampling and analysis programmes to determine the nature and extent of the water quality problems. Appropriate solutions to the problems are then developed which include mains

cleaning and renovation and replacement of parts of the distribution system. Implementation of the solutions is undertaken either by Water Service or its contractors.

Hydrogen Ion Concentration (pH)

Hydrogen Ion Concentration (pH) is used as a measure of the acidity or alkalinity of water supplies. In Northern Ireland many upland waters used for water supply, contain organic matter derived from peat which is acidic by nature.

The pH of water supplied is adjusted to control the corrosion of watermains and as a preventative measure to reduce the uptake of metals such as lead, copper and zinc from customers' plumbing.

Where the standard for pH has not been met in treated water, this may be related to a problem at a water treatment works, or occasionally from newly installed cement lined water mains in the distribution systems. As water treatment works are upgraded the number of exceedences arising from this source should decrease.

Lead

Water leaving treatment works and in the distribution systems contains only trace amounts of lead. However, where lead has been used for service pipes between the watermain and the kitchen tap or for domestic plumbing, there may be a risk of concentrations at the customer's tap exceeding the lead standard.

Many older properties still have service pipes and internal plumbing wholly or partly comprised of lead. If a sample is found to exceed the limit for lead in drinking water, both the customer and the local Environmental Health Officer are notified. Water Service will replace free of charge, any of its lead pipes supplying a property, if it receives a written request from a customer who has replaced the portion of lead service pipe for which the householder is responsible. A leaflet on lead in drinking water 'Have you got lead pipes?' is available, free of charge, from our Customer Service Units.

The majority of supplies in Northern Ireland are now being treated with orthophosphoric acid to minimise levels of lead in the water supply.

The Water Mains Rehabilitation Programme detailed Zonal studies referred to earlier includes sampling and testing for lead and aims to identify the presence of lead communication pipes in a zone. Also, where water mains are being rehabilitated, Water Service requires any lead communication pipes encountered to be replaced to the edge of the property.

Manganese

Manganese occurs naturally in many water sources. Concentrations can vary seasonally or be attributed to the disturbance of accumulated deposits at the bottom of reservoirs when the water is drawn down or when water circulation occurs. The standard for manganese has been set for aesthetic reasons to prevent unpleasant tastes, staining or discoloured water.

Polycyclic Aromatic Hydrocarbons (PAHs)

PAHs are organic compounds that can occur in drinking water due to the deterioration of coal tar linings, which were used in the past to protect iron watermains from corrosion. The ongoing watermains rehabilitation programme will continue to address this.

Pesticides

Pesticides include insecticides, herbicides, fungicides and algicides. These can find their way into watercourses from a variety of sources, mainly from use in agriculture or weed control. Water Service has an ongoing pesticide monitoring programme and currently analyses samples for 43 individual pesticides.

The pesticide exceedences were for two of the more commonly used pesticides – MCPA and Glyphosate. Water Service is currently engaged on a series of catchment management plans which will look at pesticide usage and control.

Cryptosporidium

Cryptosporidium is a protozoan parasite found in man, many other mammals and also birds, fish and reptiles. In response to the outbreaks of cryptosporidiosis in Swindon and Oxfordshire in 1988 the Government established an Expert Group to advise on the significance of *Cryptosporidium* in water supplies. The Third Group under the chairmanship of Professor Ian Bouchier reported in 1998 and the report includes the recommendations made by the two previous reports with additional comments where necessary.

The Regulations require that annual risk assessments for *Cryptosporidium* are carried out at all water treatment works, (Regulation 27). The Water Service Risk Assessments are based on a model developed by Scottish Water which took account of the recommendations of the Bouchier Report and the standard Operating Protocols published by the DWI, (England and Wales). The model was independently reviewed by the Centre for Research and Environmental Health.

Ammonium

The exceedence of the ammonium parameter is associated with the chloramination process at the Clay Lake Water Treatment Works. Water Service is reviewing the treatment processes at those water treatment works using chloramination as a means of disinfection.

Turbidity

Particulate matter, usually the re-suspension of sediments present in the distribution system, affects the turbidity of drinking water. Systematic flushing of the local pipe work usually restores water quality.

Other Parameters

A single exceedence was recorded for Nitrate. This was investigated and no repeat exceedences were recorded.

Summary

Exceedences of the regulatory standard are investigated following procedures agreed with the Health Authorities and the Drinking Water Inspectorate. Closure of an event cannot take place without their approval.

Investing for the Future

Water Treatment and the Distribution System

During the period of this report work continued on the on-going programme of improvements to our water treatment works. Water Service completed the construction of the new £25 million Mourne Water Treatment Works near the village of Drumaroad in County Down. This works has the capacity to treat up to 155 million litres of Mourne water per day. Work continued on the replacement of the existing Fofannybane Water Treatment Works located in the Mourne Mountains, close to the Fofanny Dam. This modern works will be capable of producing up to 52 million litres of high quality treated water per day. The construction of the new works will incorporate advanced engineering skills and sustainable environmental technology and has been sympathetically designed to minimise any visual impact on the surrounding countryside. During 2004 work commenced on a £5.5m contract to upgrade the treatment process at Carron Hill Water Treatment Works near Crossmaglen and a £3m project to improve the treatment process at Castor Bay Water Treatment Works. A £4m contract was also awarded to

improve the treatment process at Clay Lake Water Treatment Works which serves Keady and the surrounding area.

Water Service also continued with its detailed studies of the watermain network system throughout Northern Ireland. Contracts resulting from these studies commenced during the year, with improvements to the watermain network system in the Ballymena, Glarryford, Portadown and Craigavon areas as well as the Breda area of Belfast. Depending on the availability of funding, these detailed studies will feed into the ongoing extensive watermain rehabilitation programme over the next 9 to 12 years

Expenditure on the trunk and distribution watermain network continued throughout the year, including the commencement of the Newcastle Trunk Main. This main will transfer water to the new Newcastle Service Reservoir at Tullybrannigan and will provide security of supply to the Newcastle, Downpatrick and Clough areas. The provision of new or replacement

distribution watermains continued to take place across Northern Ireland, including parts of Rasharkin, Armagh, Lisburn, Forkhill, Omagh and Ahoghill.

Work continued throughout the year to develop the recommendations of the Water Resource Strategy. The Strategy provides Water Service with a robust basis for the development and management of secure and sustainable water resources in Northern Ireland. The studies and input stage of our second Asset management Plan (NIAMP2) was completed during the year. The output from NIAMP2 will be equivalent to a draft Business Plan which will, allow a number of possible expenditure profiles to be considered, inform decisions in relation to monetary allocation and allow a final review of the context of the Capital Works Programme taking into account budgetary constraints. It is intended to develop asset management as an on-going element within Water Service following completion of the NIAMP2 project.

Water Service's programming of improvements is dependent on the level of funding it receives. The current status of Water Service's water treatment investment for water quality improvements is set out in Appendix 4.

Research, Development and Innovation

Water Service undertakes a programme of applied research and technology development to support the development of standards and best practice and promote technical innovation. This programme is driven by the need to improve quality, whilst making efficiency gains, and contains several projects aimed at improving compliance with drinking water quality standards.

Water Service is a member of United Kingdom Water Industry Research Ltd. (UKWIR), an organisation that provides a framework for the procurement of a common research programme for UK water operators on "one-voice" issues. Projects undertaken by UKWIR during 2004 relating to water quality included the following aimed at: -

- optimising treatment to reduce plumbosolvency
- developing a framework for a drinking water safety plan
- evaluating the effectiveness of UV treatment
- assessing climate change scenarios for water resource planning

UKWIR, with Water Service input, has developed sustainability indicators which track progress in reducing the environmental impact of our activities. This work has continued and this year includes the development of an indicator for sustainable management of water resources.

Several projects initiated within Water Service have also been aimed at water quality issues. These have included:

- condition assessment of pipe materials
- treatment of water to reduce copper corrosion

The results of these projects will be implemented as part of ongoing technology development directed at quality improvement.

Public Information

Drinking Water Register

Water Service maintains a Drinking Water Register recording detailed water quality results for each water supply zone.

The Register is available for inspection, free of charge, during normal working office hours at Water Service offices listed below. Customers can examine any record on the register and obtain a free copy of the information for the water supply zone they live in. A charge may be made for printed information on other zones.

Customers who wish to receive information about the quality of water in their water supply zone by post, can write to the appropriate nearest address listed, or alternatively contact Water Service's Customer Services on:

08457 440088.

There is also a text number for customers who have hearing difficulties -

08457 023206.

Calls to these numbers are charged at the local rate.

Water Service Customer Services

Marlborough House
Central Way
Craigavon BT64 1AD

Water Service Customer Services

Westland House
Old Westland Road Belfast BT14 6TE

Water Service Customer Services

1a Belt Road
Altnagelvin
Londonderry BT47 2LL

Water Service Customer Services

Academy House
121a Broughshane Street
Ballymena BT43 6BA

Customers may also contact Customer Services by email on waterline@waterni.gov.uk.

Further information for customers may be obtained at the Water Service website:

<http://www.waterni.gov.uk>

This site includes electronic copies of current Water Service Reports.

Customer Services

Staff in Customer Services record details and the nature of all enquiries, requests for services, emergencies and complaints. All enquiries etc. are logged and routed directly to staff who will investigate the matter and resolve the problem as quickly as possible.

Water Service produces a range of leaflets about its services, including those designed to provide customers with the opportunity to learn more about water quality standards, water efficiency and the need to use water wisely. The leaflets can be obtained from Customer Service Units or may be viewed on the Water Service Website.

To assist visually impaired customers, Water Service produces a braille version of this report.

Appendix 1

DRINKING WATER QUALITY STANDARDS

SCHEDULE 1

PRESCRIBED CONCENTRATIONS AND VALUES

TABLE A.

MICROBIOLOGICAL PARAMETERS

Part I: Directive requirements

<i>Parameters</i>	<i>Concentration or Value (maximum)</i>	<i>Units of Measurement</i>	<i>Point of compliance</i>
<i>Enterococci</i>	0	number/100ml	Customers' taps
<i>Escherichia coli (E. coli)</i>	0	number/100ml	Customers' taps
Total coliforms	0	number/100ml	Customers' taps (i)

TABLE B.

CHEMICAL PARAMETERS

Part I: Directive requirements

<i>Parameters</i>	<i>Concentration or Value (maximum)</i>	<i>Units of Measurement</i>	<i>Point of compliance</i>
Acrylamide	0.10	µg/l	(ii)
Antimony	5	µg Sb/l	Customers' taps
Arsenic	10	µg As/l	Customers' taps
Benzene	1	µg/l	Customers' taps
Benzo 3 4 pyrene	0.01	µg/l	Customers' taps
Boron	1	mg B/l	Customers' taps
Bromate	10	µg BrO ₃ /l	Customers' taps
Cadmium	5	µg Cd/l	Customers' taps
Chromium	50	µg Cr/l	Customers' taps
Copper	2	mg Cu/l	Customers' taps
Cyanide	50	µg CN/l	Customers' taps
1,2 Dichloroethane	3	µg/l	Customers' taps*
Fluoride	1.5	mg F/l	Customers' taps
Lead	(a) 25, from 25th December 2003 until immediately before 25th December 2013 (b) 10, on and after 25th December 2013	µg Pb/l	Customers' taps
Mercury	1	µg Hg/l	Customers' taps
Nickel	20	µg Ni/l	Customers' taps

<i>Parameters</i>	<i>Concentration or Value (maximum)</i>	<i>Units of Measurement</i>	<i>Point of compliance</i>
Nitrate	50	mg NO ₃ /l	Customers' taps
Nitrite	0.5	mg NO ₂ /l	Customers' taps
Aldrin	0.03	µg/l	Customers' taps*
Dieldrin	0.03	µg/l	Customers' taps*
Heptachlor	0.03	µg/l	Customers' taps*
Heptachlor epoxide	0.03	µg/l	Customers' taps*
Other pesticides	0.1	µg/l	Customers' taps*
Total Pesticides (iii)	0.5	µg/l	Customers' taps*
PAH - Sum of four substances (iv)	0.1	µg/l	Customers' taps
Selenium	10	µg Se/l	Customers' taps
Tetrachloroethene / Trichloroethene - Sum (v)	10	µg/l	Customers' taps*
Total Trihalomethanes (vi)	100	µg/l	Customers' taps
Vinyl chloride	0.50	µg/l	(ii)

Notes:

- (i)** Water Service, with the agreement of the Drinking Water Inspectorate, includes Total Coliforms within the Part I: Directive Requirements table for statistical purposes
- (ii)** The parametric value refers to the residual monomer concentration in the water as calculated according to specifications of the maximum release from the corresponding polymer in contact with the water. This is controlled by product specification.
- (iii)** Total Pesticides: means the sum of the concentrations of the individual pesticides detected and quantified in the monitoring procedure.
- (iv)** The specified compounds are:
- benzo(b)fluoranthene
 - benzo(k)fluoranthene
 - benzo(ghi)perylene
 - indeno (1,2,3-cd) pyrene

The parametric value applies to the sum of the concentrations of the individual compounds detected and quantified in the monitoring process.

(v) The parametric value applies to the sum of the concentrations of the individual compounds detected and quantified in the monitoring process.

(vi) The specified compounds are:

- chloroform
- bromoform
- dibromochloromethane
- bromodichloromethane

The parametric value applies to the sum of the concentrations of the individual compounds detected and quantified in the monitoring process.

* May be monitored from samples of water leaving treatment works or other supply point, as no significant change during distribution.

Part II: National requirements

<i>Parameters</i>	<i>Concentration or Value (maximum unless otherwise stated)</i>	<i>Units of Measurement</i>	<i>Point of compliance</i>
Aluminium	200	µg Al/l	Customers' taps
Colour	20	mg/l Pt/Co	Customers' taps
Hydrogen Ion	10	pH value	Customers' taps
	6.5 (minimum)	pH value	
Iron	200	µg Fe/l	Customers' taps
Manganese	50	µg Mn/l	Customers' taps
Odour	3 at 25°C	Dilution number	Customers' taps
Sodium	200	mg Na/l	Customers' taps
Taste	3 at 25°C	Dilution number	Customers' taps
Tetrachloromethane	3	µg/l	Customers' taps
Turbidity	4	NTU	Customers' taps

SCHEDULE 2**INDICATOR PARAMETERS**

<i>Parameters</i>	<i>Specification Concentration or Value (maximum) or State</i>	<i>Units of Measurement</i>	<i>Point of monitoring</i>
Ammonium	0.5	mg NH ₄ /l	Customers' taps
Chloride (i)	250	mg Cl/l	Supply point*
<i>Clostridium perfringens</i> (including spores)	0	Number/100ml	Supply point*
Colony counts	No abnormal change	Number/1ml at 22°C Number/1ml at 37°C (48 hrs)	Customers' taps, service reservoirs and treatment works
Conductivity (i)	2500	µS/cm at 20°C	Supply point*
Hydrogen Ion	9.5	pH value	Customers' taps
Sulphate (i)	250	mg SO ₄ /l	Supply point*
Total Indicative Dose (for radioactivity) (ii)	0.1	mSv/year	Supply point*
Total Organic Carbon (TOC)	No abnormal change	mg C/l	Supply point*
Tritium (for radioactivity)	100	Bq/l	Supply point*
Turbidity	1	NTU	Treatment works

Notes:

(i) The water should not be aggressive.

(ii) Excluding tritium, potassium-40, radon and radon decay products.

* May be monitored from samples of water leaving treatment works or other authorised supply point, as no significant change during distribution. See glossary (Appendix 5).

EXPLANATORY NOTES**Measurement Units:**

mg/l means one part in a million. µg/l means one part in a thousand million. ng/l means one part in a million million.

Parameter:

A parameter refers to any substance, organism or property listed above.

Appendix 2

The Water Supply (Water Quality) Regulations (Northern Ireland) 2002

Year 2004 Authorised Departures by Water Supply Zones under
Regulation 37

Zone Code	Zone Name	Aluminium (µg/l)	Total Trihalomethanes (µg/l)	Authorised Departure Start	Authorised Departure End
Z104	Ballymena Borough Zone	--	150	01-Jan-04	31-Dec-06
Z109	Dunore North Zone	--	150	01-Jan-04	31-Dec-06
Z111	Lough Fea Zone	250	--	01-Jan-04	31-Jul-04
Z112	Mormeal Zone	250	150	01-Jan-04	31-Jul-04
Z113	Moyola Zone	--	150	01-Jan-04	31-Dec-06
Z114	Oaklands Zone	--	150	01-Jan-04	31-Dec-05
Z116	Unagh Zone	250	150	01-Jan-04	31-Jul-04
Z201	Altmore Zone	300	200	01-Jan-04	31-Dec-06
Z202	Altmore-Gortlenaghan Zone	300	200	01-Jan-04	31-Dec-06
Z203	Babylon Hill Zone	--	200	01-Jan-04	31-Dec-06
Z205	Ballydougan Zone	--	200	01-Jan-04	31-Dec-06
Z206	Ballyhannon Zone	--	200	01-Jan-04	31-Dec-06
Z207	Banbridge Zone	--	200	01-Jan-04	31-Dec-06
Z208	Castor Bay Zone	--	200	01-Jan-04	31-Dec-06
Z209	Castor Bay-Shanmoy Zone	--	200	01-Jan-04	31-Dec-06
Z211	Fofanny-Ballymaconaghy Zone	400	250	01-Jan-04	31-Dec-06
Z212	Fofanny-Banbridge Zone	400	250	01-Jan-04	31-Dec-06
Z213	Fofanny-Newry Zone	400	250	01-Jan-04	31-Dec-06
Z214	Lough Ross Zone	--	250	01-Jan-04	31-Oct-06
Z215	Lurgan Zone	--	200	01-Jan-04	31-Dec-06
Z216	Magheraliskmisk Zone	--	200	01-Jan-04	31-Dec-06
Z217	Newry Zone	400	250	01-Jan-04	31-Dec-06
Z218	Richhill Zone	--	200	01-Jan-04	31-Dec-06
Z219	Seagahan Zone	--	250	01-Jan-04	31-Dec-06
Z220	Silent Valley South Zone	400	250	01-Jan-04	31-Dec-06
Z301	Ballyhanwood Zone	400	250	01-Jan-04	31-Dec-05
Z302	Ballysallagh Zone	400	250	01-Jan-04	31-Dec-05
Z303	Breda East Zone	400	250	01-Jan-04	31-Dec-05
Z304	Breda West Zone	400	250	01-Jan-04	31-Dec-05

Zone Code	Zone Name	Aluminium (µg/l)	Total Trihalomethanes (µg/l)	Authorised Departure Start	Authorised Departure End
Z305	Clandeboyne Zone	400	250	01-Jan-04	31-Dec-05
Z306	Conlig Zone	400	250	01-Jan-04	31-Dec-05
Z308	Downpatrick Zone	400	250	01-Jan-04	31-Dec-05
Z309	Dunmurry Zone	400	250	01-Jan-04	31-Dec-05
Z310	Dunore East Zone	--	150	01-Jan-04	31-Dec-06
Z311	Hollywood Zone	400	250	01-Jan-04	31-Dec-05
Z312	Kilkeel-Annalong Zone	400	250	01-Jan-04	31-Dec-06
Z313	Lisbane Zone	400	250	01-Jan-04	31-Dec-05
Z314	Lisburn North Zone	400	250	01-Jan-04	31-Dec-05
Z315	Lisnabreeny Zone	400	250	01-Jan-04	31-Dec-05
Z316	Lough Cowey Zone	--	150	01-Jan-04	31-Dec-06
Z317	North Peninsula Zone	400	250	01-Jan-04	31-Dec-05
Z318	Oldpark Zone	--	250	01-Jan-04	31-Dec-06
Z319	Purdysburn South Zone	400	250	01-Jan-04	31-Dec-05
Z320	Stoneyford Zone	400	250	01-Jan-04	31-Dec-05
Z321	Woodvale Zone	400	250	01-Jan-04	31-Dec-05
Z322	Purdysburn North Zone	400	250	01-Jan-04	31-Dec-05
Z403	Carmony Zone	--	150	01-Jan-04	31-Dec-04
Z405	Glenhordial Zone	250	150	01-Jan-04	30-Nov-05
Z406	Killea Zone	--	150	01-Jan-04	31-Dec-04
Z408	Lenamore Springs Zone	250	150	01-Jan-04	30-Nov-05
Z409	Foyle Zone	--	150	01-Jan-04	31-Dec-04
Z410	Lough Braden Zone	250	150	01-Jan-04	30-Nov-05
Z411	Lough Macrory Zone	250	150	01-Jan-04	30-Nov-05
Z413	Limavady Zone	--	150	01-Jan-04	31-Dec-04

Programmes of Work to meet Authorised Departure Requirements

During 2004, certain planned and remedial programmes of work to meet Authorised Departure requirements were completed. These were:

Water Treatment Works	Zone code affected	Zone name affected
Carmoney WTW	Z403	Carmoney Zone
	Z406	Killea Zone
	Z409	Foyle Zone
	Z413	Limavady Zone
Lough Fea WTW	Z111	Lough Fea Zone
	Z112	Mormeal Zone
	Z116	Unagh Zone

Appendix 3

Water Quality Report for Water Supply Zones

Schedule 1 parameters	2004 Samples	No > PCV	% > PCV	No > AD	% > AD
<i>Enterococci</i>	506	0	0.00%	--	--
<i>E. coli</i>	5054	3	0.06%	--	--
Total coliforms	5054	33	0.65%	--	--
Aluminium	2314	255	11.02%	12	0.52%
Antimony	511	0	0.00%	--	--
Arsenic	511	0	0.00%	--	--
Benzo 3 4 pyrene	511	0	0.00%	--	--
Bromate	511	0	0.00%	--	--
Cadmium	511	0	0.00%	--	--
Chromium	511	0	0.00%	--	--
Colour	1965	20	1.02%	--	--
Copper	525	0	0.00%	--	--
Hydrogen Ion	1962	20	1.02%	--	--
Iron	1962	46	2.34%	--	--
Lead	492	25	5.08%	--	--
Manganese	1962	22	1.12%	--	--
Nickel	511	0	0.00%	--	--
Nitrate	543	1	0.18%	--	--
Nitrite	543	0	0.00%	--	--
Odour	1959	0	0.00%	--	--
Selenium	511	0	0.00%	--	--
Sodium	527	0	0.00%	--	--
Taste	1959	0	0.00%	--	--
PAH - Sum of four substances	511	0	0.00%	--	--
Total Trihalomethanes	1057	358	33.87%	4	0.38%
Turbidity	1966	5	0.25%	--	--

Indicator parameters	2004 Samples	No > SPEC	% > SPEC
Total - Residual disinfectant	5034	0	0.00%
Free - Residual disinfectant	5035	0	0.00%
Colony Counts 37 (48hrs)	1947	0	0.00%
Colony Counts 22	1948	0	0.00%
Hydrogen Ion	1962	8	0.41%
Ammonium	1954	2	0.10%

Water Quality Report for Authorised Supply Points

<i>Schedule 1 parameters</i>	<i>2004 Samples</i>	<i>No > PCV</i>	<i>% > PCV</i>	<i>No > AD</i>	<i>% > AD</i>
Benzene	440	0	0.00%	--	--
Boron	440	0	0.00%	--	--
Cyanide	440	0	0.00%	--	--
1.2 Dichloroethane	440	0	0.00%	--	--
Fluoride	452	0	0.00%	--	--
Mercury	440	0	0.00%	--	--
Aldrin	440	0	0.00%	--	--
Dieldrin	440	0	0.00%	--	--
Heptachlor	440	0	0.00%	--	--
Heptachlor Epoxide	440	0	0.00%	--	--
Total Pesticides	440	1	0.23%	--	--
All other analysed Pesticides	17583	4	0.02%	--	--
Tetrachloroethene/ Trichloroethene - Sum	440	0	0.00%	--	--
Tetrachloromethane	440	0	0.00%	--	--

<i>Indicator parameters</i>	<i>2004 Samples</i>	<i>No > SPEC</i>	<i>% > SPEC</i>
<i>Clostridium perfringens</i>	2853	16	0.56%
Chloride	445	0	0.00%
Conductivity	2893	0	0.00%
Sulphate	452	0	0.00%
Total Organic Carbon	457	0	0.00%
Total Indicative Dose	440	0	0.00%
Tritium	440	0	0.00%

Water Quality Report for Water Treatment Works

<i>Schedule 1 parameters</i>	<i>2004 Samples</i>	<i>No > PCV</i>	<i>% > PCV</i>
Total coliforms	9591	15	0.16%
<i>E. coli</i>	9590	8	0.08%
Nitrite	858	12	1.40%

<i>Indicator parameters</i>	<i>2004 Samples</i>	<i>No > SPEC</i>	<i>% > SPEC</i>
Turbidity	9570	254	2.65%
Total - Residual disinfectant	9514	0	0.00%
Free - Residual disinfectant	9514	0	0.00%
Colony Counts 37 (48hrs)	9587	0	0.00%
Colony Counts 22	9585	0	0.00%

Water Quality Report for *Cryptosporidium* Oocysts

<i>Parameter</i>	<i>2004 Samples</i>	<i>No > Reporting Level</i>	<i>% > Reporting Level</i>
<i>Cryptosporidium</i> Oocysts	1519	0	0.00%

Water Quality Report for Service Reservoirs

<i>Schedule 1 parameters</i>	<i>2004 Samples</i>	<i>No > PCV</i>	<i>% > PCV</i>
Total coliforms	18258	59	0.32%
<i>E. coli</i>	18258	11	0.06%

<i>Indicator parameters</i>	<i>2004 Samples</i>	<i>No > SPEC</i>	<i>% > SPEC</i>
Colony Counts 22	18232	0	0.00%
Colony Counts 37 (48hrs)	18232	0	0.00%
Total - Residual disinfectant	18099	0	0.00%
Free - Residual disinfectant	18098	0	0.00%

Appendix 4 Investment Programme

Over the last eight years improvement work has been completed at the following water treatment works:

Altnahinch WTW

Ballysallagh WTW

Carmony WTW

Caugh Hill WTW

Derg WTW

Dungonnel WTW

Killyhevlin WTW

Lough Bradan WTW

Lough Fea WTW

Rathlin Island WTW

Woodburn WTW

During the year Water Service commissioned the following water treatment works:

Drumaroad WTW

Lough Macrory WTW

Water Service also continued work at:

Fofanny WTW

Carron Hill WTW

Looking towards the future, as well as any necessary enhancement to the above water treatment works, improvement work is scheduled for the following:

Ballinrees WTW

Clay Lake WTW

Castor Bay WTW

Dunore Point WTW

Moyola WTW

Seagahan WTW

Appendix 5 Glossary of Technical Terms

Aesthetic	Associated with the senses of taste, smell and sight.
Authorised Departure (AD)	A time limited authorised departure from the regulatory limit for certain parameters, provided that there is a planned programme of work at the water treatment works to improve the water quality and that there are no adverse health implications.
Authorised Supply Point	A sampling point within the distribution system authorised by the DWI for certain parameters, because the results of the analysis of such samples are unlikely to differ in any material respect from the results of the analysis of samples taken from customers' taps.
Catchment	The area of land that drains into a watercourse.
Chloramination	An alternative form of disinfectant, based on chlorine and ammonia, which provides a longer lasting residual in the distribution system compared to free chlorine.
Coagulation	The process of aggregating colloidal and fine particulate matter into a settleable material.
Coliforms	A group of bacteria which may be faecal or environmental in origin.
Compliance assessment	A comparison made by the DWI of data (gathered by Water Service) against standards and other regulatory requirements.
Contravention	A breach of the regulatory requirement.

Cryptosporidiosis	The illness produced by infection with <i>Cryptosporidium</i> .
<i>Cryptosporidium</i>	A protozoan parasite.
Determination	A single analytical result for a specific parameter.
Distribution systems	Water Service's network of mains, pipes, pumping stations and service reservoirs through which treated water is conveyed to customers.
Drinking Water Directive	European Council Directive (98/83/EC) relating to the quality of water intended for human consumption.
DWI	Northern Ireland Drinking Water Inspectorate - has an independent responsibility to audit drinking water quality compliance against the standards set in the Regulations.
Event	A situation affecting or threatening to affect drinking water quality.
Exceedence	Synonym for contravention (see above).
Faecal coliforms	A sub-group of coliforms, almost exclusively faecal in origin.
Filtration	The separation of suspended particulate matter from a fluid.

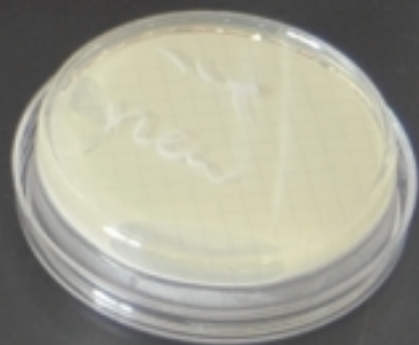
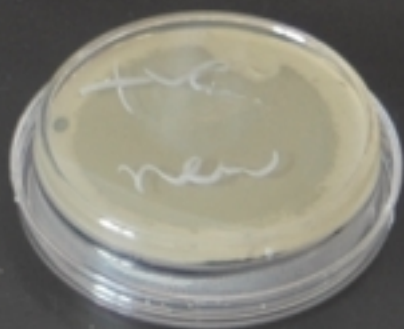
Groundwater	Water from aquifers or other underground sources.
Hydrogen Ion	A measure of the acidity or basicity related to the concentration of the hydrogen ion (also referred to as pH).
Incident	An event where there has been a demonstrable deterioration in the quality of drinking water.
Investment programme	Investment in improvement works to water treatment works and distribution systems.
Mains rehabilitation	Restoration or replacement of water mains pipework to a proper condition.
Microbiological	Associated with the study of microbes.
m³/d	Cubic metres per day.
mg/l	Milligrammes per litre.
ml	Millilitre.
MI/d	Megalitres per day (one MI/d is equivalent to 1,000 m ³ /d or 220,000 gallon/d).

ng/l	Nanogrammes per litre.
Oocyst	The resistant form in which <i>Cryptosporidium</i> occurs in the environment, and which is capable of causing infection.
Orthophosphoric acid	A chemical dosed in low concentrations at water treatment works to minimise the uptake of lead from old pipework into customers' water.
PAHs	A group of organic compounds known as polycyclic aromatic hydrocarbons, comprising, for the purposes of the Regulations, four substances: <ul style="list-style-type: none">- benzo(b)fluoranthene- benzo(k)fluoranthene- benzo(ghi)perylene- indeno (1,2,3-cd) pyrene
Parameter	A parameter is any substance, organism or property listed in the regulations.
Pathogen	An organism which causes disease.
PCV	See 'Prescribed concentration or value'.
Pesticides	Any fungicide, herbicide or insecticide or related product (excluding medicines) used for the control of pests or diseases.

Hydrogen Ion	A measure of the acidity or basicity related to the concentration of the hydrogen ion (also referred to as pH).
Plumbosolvency	The tendency for lead to dissolve in water.
Prescribed Concentration or Value	The numerical value assigned to water quality standards (PCV), defining the maximum or minimum legal concentration or value of a parameter. In certain circumstances, the DWI may authorise a time limited departure from the regulatory value. See 'Authorised Departure'.
Protozoan parasites	A single celled organism that can only survive by infecting a host.
Public register	The information made available by Water Service to the public as required by regulation 34.
Regulations	The Water Supply (Water Quality) Regulations (Northern Ireland) 2002 S.R. No.331 ISBN 0-337-94388-5.
Remedial action	Action taken to improve a situation.
Service reservoir	A water tower, tank or other reservoir used for the storage of treated water within the distribution system.

Springs	Groundwater appearing at the surface at the outcrop of the junction of an impermeable stratum.
Supply point	See authorised supply point
Surface water	Water from rivers, impounding reservoirs or other surface water sources.
Technical audit	The means of checking by the DWI that Water Service is complying with its statutory obligations.
Toxicology	The study of the health effects of substances.
Treated water	Water treated for use for domestic purposes as defined in the Regulations.
Trihalomethanes (THMs)	A group of organic substances comprising, for the purposes of the Regulations, four substances: <ul style="list-style-type: none">- trichloromethane (also known as chloroform)- dichlorobromomethane- dibromochloromethane and- tribromomethane.
µg/l	Microgrammes per litre.

UKAS	The sole national accreditation body recognized by government to assess, against internationally agreed standards, organizations that provide certification, testing, inspection and calibration services.
Water supply zone	The basic unit of supply for establishing sampling frequencies, compliance with standards and information to be made publicly available.
Website	Location of information on the Internet. Water Service's website is: http://www.WaterNI.gov.uk
Wholesomeness	A concept of water quality which is defined by reference to standards and other requirements set out in the Regulations.





Water
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