northern ireland water

Delivering what matters

Drinking Water Quality

Annual Report 2016

Introduction and Foreword

I am pleased to present Northern Ireland Water's (NI Water) Annual Drinking Water Quality report covering the calendar year 2016 and I am delighted to report that we continue to deliver a very high drinking water quality to our customers.

NI Water's core function is to produce high quality drinking water in a cost effective manner to meet the needs of all our customers, both existing and future. By doing this we contribute to the health and wellbeing of the community we serve and the needs of our commercial customers in a sustainable way.

Drinking water is carefully monitored and tested for quality. This report summarises NI Water's results from 1 January 2016 to 31 December 2016 to meet the requirements of the Regulations under which we operate. During this reporting period, 99.86% of all tests carried out on samples taken from water treatment works, service reservoirs and customer taps complied with the regulatory standards assessed using Overall Percentage Compliance. This measure has been adopted as the standard, high level, indicator for water quality throughout the treatment and distribution processes across the UK.

At the same time as maintaining a very high quality of drinking water for our customers, NI Water again also returned the highest ever quality of treated wastewater safely back to the environment.

Like much of the UK water industry, NI Water has continued to have issues with elevated levels of pesticides in our catchments. This is caused largely by wash-off from agricultural land during the very wet weather events we have experienced in recent years. We continue to liaise closely with the farming community and other stakeholders through the Water Catchment Partnership and the SCaMP NI (Sustainable Catchment Management Planning) programme to try and minimise the chances of reoccurrence in the future – updated details of this are contained in this report, including trials of alternative methods of weed control.

NI Water is a customer focused but asset based organisation. In order to deliver the maximum level of customer service at the lowest sustainable cost, it is important that NI Water assigns expenditure in the most effective possible manner. Although our funding programme for our PC15 price control period (2015-21) continues to be uncertain, we are committed to overcome the challenges presented to us and will continue to work closely with our economic and environmental regulators, the Consumer Council and other stakeholders to maintain and improve our services to our customers. Our capital investment programme to maintain and safeguard water quality for the reporting period is set out using the Northern Ireland super council areas in Appendix 3.

As part of NI Water's reporting requirements, this report also incorporates data to meet the requirements of the Water Supply (Water Fittings) Regulations (NI) 2009.

We are now seeing the benefit of the investment in our overall infrastructure and systems over the past number of years, and as we move forward our investments will be more directly customer focussed to improve water quality at a local level, despite ever present financial pressures. We continue to exceed the targets placed upon us by our regulators to comply with water quality standards, and will continue to improve the service to all our customers in the future.

Please note, in May 2016 Northern Ireland's government departments were restructured from 12 down to 9 departments with NI Water now reporting to the Department for Infrastructure (DfI). A summary of the departmental changes can be found at Appendix 7.

Sara Venning
Chief Executive Officer


The human body is made up of 75% water
Helps prevent premature aging
#Delivering whatmatters
Why use weed-wipers?

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Water Quality Standards

During 2016 Drinking Water Quality in Northern Ireland was assessed against standards set in the Water Supply (Water Quality) Regulations (Northern Ireland) 2007 as amended. The regulations 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 NI Water 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
- the provision and publication of information

NI Water assesses standards for water quality against the parameters 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 aesthetically acceptable.

The Regulations set demanding standards for the quality of drinking water but contraventions of these standards do not necessarily mean the water represents any public health risk. These contraventions are reported to the Drinking Water Inspectorate (DWI), investigated by NI Water, and prompt remedial action taken where appropriate.

NI Water has a monitoring programme in place which covers raw waters, water at various treatment stages, drinking water in distribution and at the customer tap. NI Water liaises with its customers on a wide variety of issues. Where there is an exceedance of a regulatory parameter, investigations and remedial work are carried out to ensure that drinking water is regulatory compliant. Where the monitoring programme highlights a problem with the customer's plumbing, NI Water informs the customer, the local Environmental Health Officer and the DWI.

To assist in understanding the contents of this report, a glossary of technical terms is provided (Appendix 7).

A water supply zone is a designated area with a population of no more than 100,000 supplied with water from one water treatment works or blended water from several works.

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 monitoring arrangements are audited by the 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 customer taps in the water supply zones. In addition to the regulatory sampling frequency requirement, NI Water also carries out operational sampling and analyses to monitor and optimise the processes and quality of our drinking water supplies.

Under the Regulations, samples to be analysed for parameters which do not change in the supply water main may be collected from Authorised Supply Points. These samples are collected from the final distribution 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. NI Water uses 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 customer taps are taken at random addresses in each water supply zone. A water supply zone is a designated area with a population of no more than 100,000 supplied with water from one water 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 51 water supply 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. Colour

Compliance with the drinking water standards is determined by comparing the results of laboratory analysis of water samples with the relevant Prescribed Concentrations or Values (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. NI Water will at all times liaise with the DWI and the Public Health Agency (PHA) to ensure customer safety.

NI Water reports its water quality compliance levels as overall percentage compliance. This assesses all regulatory consented parameters at water treatment works, service reservoirs as well as customer tap. This is a holistic approach and is supported by the DWI and the Northern Ireland Authority for Utility Regulation (NIAUR).

Drinking Water Quality Summary – Year on Year

Compliance assessed against the "Water Supply (Water Quality) Regulations (Northern Ireland) 2007" as amended.

Compliance Measure	2012	2013	2014	2015	2016
% Overall compliance with drinking water regulations	99.77%	99.81%	99.86%	99.83%	99.86%
% Compliance at consumers tap (including supply points)	99.63%	99.74%	99.78%	99.74%	99.77%
% Iron compliance at consumers tap	97.25%	98.08%	98.95%	98.40%	98.66%
% Service Reservoirs with coliforms in >5% samples	0.30%	0.00%	0.00%	0.00%	0.00%

Protecting Our Customers

Drinking Water and Health

The safety of drinking water is paramount to public health. It is a tribute to the skills and expertise of colleagues working for drinking water providers, regulators, health authorities and local authorities that the safety of drinking water in Northern Ireland is something that the public is able to take for granted.

The Drinking Water and Health Liaison Group (DW&HLG) is a multi-agency group which considers public health issues associated with the drinking water supply. The Group, which is unique in the UK context, draws its membership from the main stakeholder organisations including the Department of Health, Social Services and Public Safety, the PHA, the DWI, the Northern Ireland Public Health Laboratory, the Chief Environmental Health Officers' Group and NI Water.

The group produced a comprehensive guidance document on "Drinking Water and Health" aimed at professionals from a variety of backgrounds who share an interest and involvement in the safety of drinking water. The purpose of this joint guidance is to set out the roles and responsibilities of the key players, to describe the wider context to the provision of safe drinking water, to detail the arrangements and protocols in place to monitor compliance with standards and to respond to an emergency or incident situation.

This guidance is a "living document" that is regularly reviewed and updated.

The guidance document can be found at:
https://www.niwater.com/drinking-water-guidance/

Lead Monitoring for Vulnerable Customers

The regulatory limit for lead in drinking water was reduced at the end of 2013 from 25µg/l to 10µg/l. In advance of this reduction, from 2011 NI Water (in liaison with the Northern Ireland Education Authorities) put in place a monitoring programme to identify potential high lead levels for schools.

Primary Schools in Northern Ireland have been prioritised based on the age of the school and dates of any building modification and sampled as part of this programme. From this, a monitoring programme was initiated in 2011 that began with the top priority schools and has now been completed.

Any school where lead levels were found to be above the 10µg/l standard was investigated and the lead pipework replaced by NI Water and the Education Authorities, as appropriate.

This monitoring programme was further expanded to children's hospitals and children's homes during 2013. Other non-domestic locations where children spend a significant amount of their time will be considered as they are identified and opportunistically replaced.

Lead Pipework Replacement Programme

The NI Water Asset Strategy for Management of Lead sets out NI Water's approach to the management of lead in drinking water.

The strategy details how NI Water will work to reduce the likelihood of lead failures at customers' taps whilst working within its current remit. The overall approach will be a combination of three strands, as summarised below:-

- Removal of NI Water owned lead assets from the water distribution system
- Minimise the adsorption of lead into drinking water
- Encourage the removal of customer owned lead assets

NI Water has been carrying out lead pipe replacements for a number of years under the following programmes of work by:-

- Actively replacing lead pipes during water mains replacement and when water quality testing indicates lead pipe is present
- Actively replacing lead pipes when a customer requests NI Water to replace lead pipework to their property when they have replaced lead pipe internally in their property

During PC15 NI Water will be replacing over 1800 lead pipes per year within its distribution network. This programme of replacement has been developed to ensure that NI Water prioritises and targets areas with high numbers of lead pipes and poor compliance with the lead standard.

Drinking Water Safety Plans

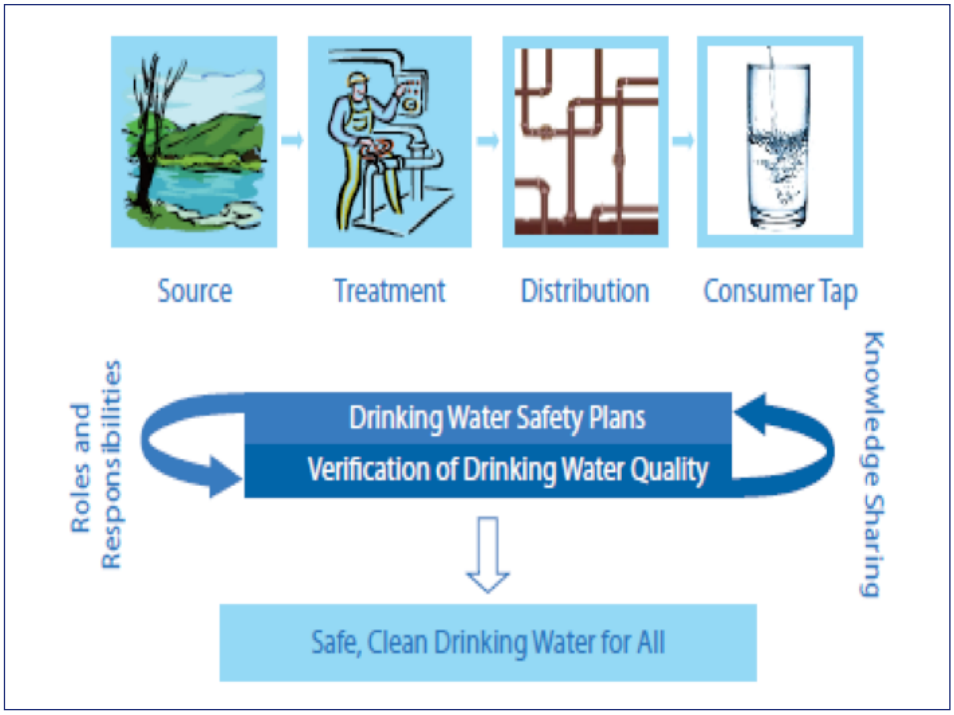
A Drinking Water Safety Plan (DWSP) is the most effective way of ensuring that a water supply is safe for human consumption and that it meets the health based standards and other regulatory requirements. It is based on a comprehensive risk assessment and risk management approach to all the steps in a water supply chain from catchment to consumer.

The primary objectives of a DWSP in protecting human health and ensuring good water supply practice are the minimisation of contamination of source waters and effective treatment using appropriate processes. DWSPs are used to map water supply systems, identify the hazards at each stage of the system from catchment, through treatment and the distribution system, to the customer's tap, and to assess the risks that these hazards pose.

The Water Industry has adopted the DWSP approach to risk management from the raw water source, through water treatment, distribution and to our customer's taps. NI Water has put in place systems to identify hazards, assess risks and implement mitigation measures, which could potentially threaten each stage of the water supply process. NI Water works with the Northern Ireland Environment Agency (NIEA), the DWI, Forestry Service and other Non-Government Organisations to protect the raw water sources from contamination.

The outputs of these plans – "The Drinking Water Safety Plans" themselves continue to be embedded into company policies and procedures and are reviewed using a risk based approach each year. In the long term DWSPs will lead to improved security of supply, a reduction in regulatory failures, incidents and customer complaints and hence increased customer confidence.

NI Water uses the DWSP risk assessments to inform the investment strategy for drinking water.



Sustainable Catchment Management Planning Northern Ireland (SCaMP NI)

The aim of NI Water's SCaMP NI project is to improve the quality and reliability of the water received at NI Water's raw water abstraction points through sustainable catchment based solutions that focus on protecting and enhancing the natural environment. NI Water has a background of doing just that on the land we own around our reservoirs and catchment areas – many of which the public can visit and enjoy.

The environmental impact of land management practices affects the quality of the water in our rivers and lakes. This precious natural resource which we all often take for granted is abstracted and treated ready for human consumption by NI Water.

As a Company, NI Water has a history of sustainably managing the land we own surrounding our reservoirs to reduce the pollutants entering the watercourses. However, in many areas NI Water does not own the land draining into the rivers and lakes and we need to work with others to holistically manage catchments. In some cases, river basins can transcend jurisdictions so a coordinated cross-border approach is required to reduce the pollutants entering the watercourses. Reducing pollution at source avoids the need for expensive capital investment in WTWs and reduces operating costs to remove substances such as sediments that cause increased colour and turbidity issues, and also pesticides from the raw water abstracted for the drinking water supply.

Catchment Management Studies

The SCaMP NI team have been carrying out a series of Catchment Management Studies for the drinking water catchment areas. The Catchment Management Studies aim to undertake a scoping and planning study of the drinking water catchments. This uses the approach advocated in the UK Water Industry Research (UKWIR) framework for quantifying the benefits of catchment management, to establish the basis for a programme of management that provides business benefits to NI Water. Diffuse water pollution and insensitive land management may pollute surface and ground water supplies with substances such as nutrients, pesticides and microbial pathogens. It may also increase colour, turbidity and suspended solids in abstracted water. These unwelcome substances increase the capital and operating costs of water treatment, increase the quantity of effluent and waste produced, and increase the carbon footprint of the industry.

Where such risks are identified in drinking water catchments, NI Water aims to implement catchment management schemes that improve raw water quality, enhance water resources and reduce future catchment-based risks to raw water quality and quantity. We also want to meet NI Water's obligations as a responsible landowner whilst adopting an approach which gives a sustainable reduced cost for treating water to a high quality.

There are 23 drinking water catchments in N Ireland and so far we have completed 18 catchment studies with the aim of completing the remaining studies in the next 2 years. The Catchment Management Studies will inform where future SCaMP NI projects are possible to sustainably improve raw water quality and achieve environmental benefits.

Types of SCaMP NI projects

The SCaMP NI project has been successful at demonstrating how, by working together, we can manage catchments for water quality and an improved natural environment. A SCaMP NI Steering Group, involving representatives from a wide range of environmental stakeholders, meets regularly with the aim of ensuring that actions are aligned with best practice and the aims and objectives of all stakeholders, therefore contributing holistically to sustainable catchment management.

Catchment Management

The following types of projects have been carried forward by SCaMP NI recently:

- Working on Cross-Border Catchments – Several of our catchments straddle the border with the Republic of Ireland and through the development of an INTERREG VA funding application, a close working relationship has been established with Irish Water to co-operate to mutual benefit and to deal with the issues through joint SCaMP initiatives.
- Managing Invasive Species - Many non-native species have been intentionally or unintentionally introduced into Northern Ireland from around the world. NI Water have been working to ensure that the spread of invasive species is managed on NI Water landholdings.
- Public Recreation and Access - NI Water welcomes members of the public to enjoy access to its land and will endeavour to facilitate recreational activities, where it is safe to do so. A Recreation and Access Policy has been developed to provide a framework defining what access is permitted to NI Water owned lands and waters, and how access arrangements will be communicated, controlled and governed.
- Wildfire Control - Wildfires have devastating effects on habitats, flora & fauna and can also result in a deterioration in raw water quality and increased treatment costs. This has been a particular issue in the Mournes drinking water catchment. NI Water, in conjunction with stakeholders have developed a coordinated approach to wildfire prevention in order protect the water supply and preserve the Mourne landscape for generations to come.
- Riparian Planting - The SCaMP NI team have been working with stakeholders to plant riparian zones. These are vegetated areas or buffer strips along watercourses, usually planted with trees, which helps shade and partially protect water from the impact of adjacent land uses. It plays a key role in increasing water quality in associated streams, rivers, and lakes, thus providing environmental benefits through intercepting sediments/nutrients, intercepting pesticides, and bank stabilization.
- Dealing with Pesticides - In recent years there have been rising levels of the grassland herbicide MCPA found in watercourses across N Ireland, which is difficult and expensive to remove in the water treatment process. Work has continued with The Water Catchment Partnership to deliver the message to effectively tackle the problem of pesticides in the water environment. This has involved distribution of best practice advice at agricultural shows and farm engagement visits in problem areas and co-operative working with the agricultural and amenity sectors.

Water Catchment Partnership engagement at Agricultural Shows

- Forestry Management - Some water catchments are particularly vulnerable to the effects of forestry felling and replanting activities, due to their particular soils and underlying geology. Forestry activities require careful planning in order to avoid any detrimental impacts on raw water quality which is abstracted for water treatment. NI Water have been working closely with the forestry industry to minimise any detrimental effect to raw water quality or the environment.
- Peatland Restoration - Over the years many peat bogs have been overgrazed by livestock or damaged when drainage ditches were dug, giving rise to exposed peat that is susceptible to erosion. The management of grazing and creation of peat dams reduces the water velocity in the drains, reduces runoff and improves raw water quality and reliability. This results in cost savings at the treatment works as the requirement for chemical treatment to remove colour from the raw water will be reduced.

Catchment Management

CASE STUDY 1 – 'Source To Tap' INTERREG VA Project

The Derg and Erne drinking water catchments straddle the border and are predominantly rural in nature. NI Water have joined up with a range of partners and have been successful in an EU funding bid to carry out an innovative SCaMP project in the Derg and Erne catchments. The project will be called the 'Source To Tap' project and will begin in 2017 with completion by 2022.

River Derg at Castlederg

Catchment Management

In the upper reaches of these catchments the landscape is dominated by peatbog and forestry with more intensification of land for agricultural use in the lower reaches. Activities such as forestry and farming can cause contaminants such as sediments and pesticides to run off the land and drain into the raw water which NI Water abstracts for drinking water causing increased costs to treat and remove them before the water can be used for drinking water supply. Therefore, it is more cost effective for us all to keep our rivers and lakes clean than it is to intensively treat our water.

Funding

Recognising the need for a joint approach in managing the catchments from which our drinking water is abstracted, NI Water has successfully bid for and been awarded a grant of €4.9m. This funding is allocated under INTERREG VA, Priority Axis 2 – Environment, Specific Objective 4 and aims to contribute to the improvement of freshwater quality in cross border river basins. It comprises ERDF (European Regional development Fund) and government match funding from both the Northern Ireland Executive and the Government of Ireland.

Partners

NI Water will lead a partnership which includes Irish Water, The Rivers Trust, Ulster University, Agri Food and Bioscience Institute (AFBI) and East Border Region. Together the partners will deliver proposals and test pilots for how to protect raw water quality at source across both jurisdictions. These will contribute to improvements in the raw water quality abstracted for water treatment in the Erne and Derg cross-border river catchments, through the active involvement of land managers and the public, and lead to the delivery of a Sustainable Catchment Area Management Plan.

Objectives

Water catchments are designed to be the first stage of a multiple barrier approach to water treatment. The Source To Tap project will trial pilot studies to reduce the contaminants getting into the water in the first place and raise awareness of the importance of protecting our precious drinking water resource.

Catchment Management

The project includes a number of different work packages which will ultimately lead to the production of a sustainable catchment management plan. The project will include the following aspects:

- Identifying the threats - The partners will carry out an assessment of the issues and threats impacting on the quality of freshwater abstracted from the Erne and Derg catchments for drinking water through geographical information systems, risk assessments and knowledge gained from engagement with the local community.
- Working with the local communities - The project will work with the local communities to raise awareness of the importance of protecting freshwater resources and give them ownership of the issue and create a legacy to protect local water quality into the future. It will do this by employing Project Officers who will be the local face of the project and who will work with the community to empower them to identify issues threatening water quality and to become part of the solution.
- Dealing with agriculture - The partners will work together to develop and implement a pilot land incentive scheme to encourage changes in land management practices to reduce pollution. Project Officers will work to promote the pilot land incentive scheme in suitable sub catchments and water quality monitoring will be used to assess the impact of the scheme in reducing pesticide and sediment run off.
- Dealing with forestry - The project will work with stakeholders such as Forest Service NI and Coillte to implement a forestry best practice pilot to reduce sediment run-off from forestry activities. Water quality monitoring will be used to assess the impact of the forestry best practice pilots in reducing colour and turbidity run-off from these activities.
- Peatland Restoration - The project will work with Forest Service NI to restore up to 135 hectares of peatland previously used for forestry which is located alongside watercourses. By blocking drains and restoring the peat back to its near natural form, the peatbog will retain sediments and colour from draining off from these areas which can be expensive to treat at the water treatment works. A monitoring programme will determine the success of this pilot.
- Building relationships and sharing knowledge - By working together within the project it is hoped that a sustainable approach to the improvement and protection of drinking water is adopted and that land managers can see the benefits. The project will develop relationships between the water companies and other stakeholders to improve cross-border communication, thus building the foundations for the future. The project will aim to share findings to improve best practice with stakeholders on the island of Ireland and Scotland.
- Assessing the Benefits - The project will evaluate and assess the impact of these different measures following the UK Water Industry (UKWIR) Benefits Assessment Framework for Drinking Water Catchments. It will also identify recommendations to both water companies on how they might sustainably manage raw water quality in the future.
- SCaMP Plan - Collectively the information from the project will be used to produce the SCaMP plan for the Erne and Derg catchments. The Plan will be a resource for the water companies in sustainably managing the Erne and Derg catchments in the future. It will identify the issues and threats to drinking water sources, aim to report on the benefits assessment of the community engagement, the forestry pilot, the peat restoration and the land incentive pilot and deliver proposals for how best to protect raw water quality at source across both jurisdictions.

The project has been supported by the European Union's INTERREG VA Programme, managed by the Special EU Programmes Body

Interreg
Northern Ireland - Ireland - Scotland
European Regional Development Fund

Catchment Management

CASE STUDY 2 – ‘Co-operation Across Borders for Biodiversity Project’ INTERREG VA Project

NI Water have been working in partnership with Royal Society for the Protection of Birds Northern Ireland (RSPB NI) and other partners on a project funded by INTERREG VA and managed locally by the Special European Union Programmes Board (SEUPB). The project is called the ‘Co-operation Across Borders for Biodiversity’ (CABB) Project and will begin in 2017, with completion in late 2021.

Garron Plateau, Co. Antrim

Catchment Management

Project Objectives

The overall objective of the CABB project is to bring about the recovery of protected habitats (active raised and blanket bog) and priority species (breeding waders and marsh fritillary at key sites) on a cross border and cross country basis. The overall CABB project has been awarded €4.6m of EU funding for projects in Scotland, N Ireland and the Republic of Ireland. CABB will contribute to delivering the EC Birds and Habitats Directives and Biodiversity Strategies in each of the three countries and will also link with strategies for climate change mitigation and adaptation and sustainable development in the three countries, as well as Programme for Government targets.

What will the project mean for NI Water?

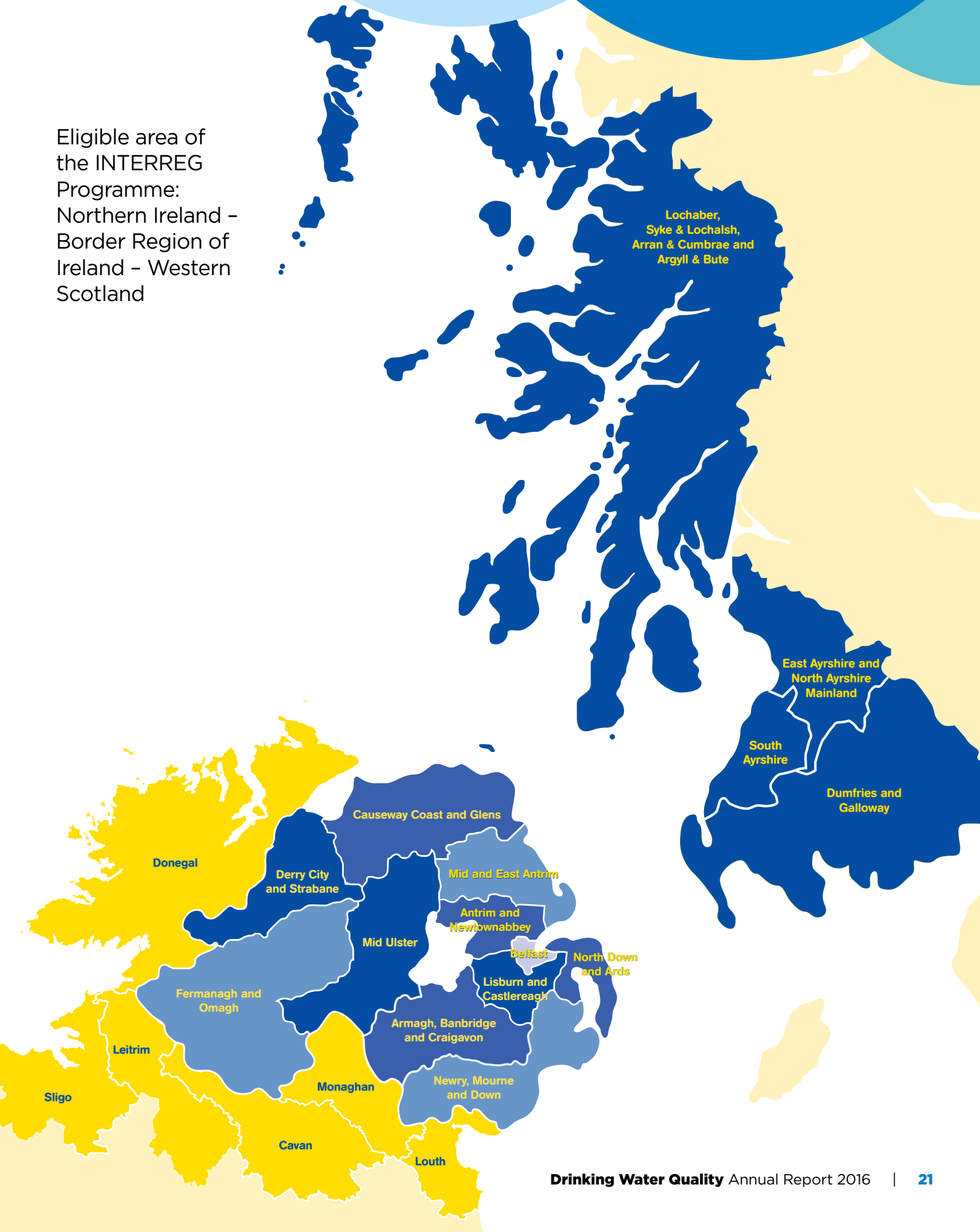
The NI Water aspect of the project will involve a €1.75k project to restore of the entire Dungonnell WTW catchment area at Garron Plateau on the Antrim Hills, which is in the catchment of Dungonnell WTW. NI Water owns 2000ha of the Garron Plateau SAC and previously 72ha of land has had drain blocking work done. Through CABB, an additional 444ha of blanket bog will be managed by blocking 38.4km of drains. NI Water will oversee the drain blocking and also aim to produce an information booklet highlighting how the work was done and the benefits delivered.

Garron Plateau is the largest expanse of intact blanket bog in Northern Ireland and it is home to protected birds of prey and rare plants such as marsh saxifrage and bog orchid. NI Water, working with the assistance of the RSPB NI and INTERREG VA aim protect and restore the peatland on the plateau, ensuring that the whole catchment is managed sustainably.

The CABB project will restore the natural hydrological conditions by blocking drains using peat, stone and sheet dams to raise the water table. This results in raising the water table and the "re-wetting" of the bog, promoting colonisation by Sphagnum moss, an essential component of a functioning bog. The creation of these peat dams reduces the water velocity in the drains and allows more settlement time. This reduces runoff and improves raw water quality and reliability by improved regulation of supply through the retention effects of the bog. This will result in cost savings at the treatment works as the requirement for chemical treatment to remove colour from the raw water will be reduced.

The project has been supported by the European Union's INTERREG VA Programme, managed by the Special EU Programmes Body

Eligible area of the INTERREG Programme: Northern Ireland – Border Region of Ireland – Western Scotland



Catchment Management

CASE STUDY 3 – A Rush Solution without Pollution

What is the problem?

There have been high residual levels of pesticides found in the raw water at many of NI Water's drinking water sources across NI over the past number of years. This has been particularly difficult and expensive for NI Water to remove in the treatment process to produce quality drinking water. It has also resulted in water quality issues and DWI enforcement orders. The herbicide MCPA is a particular problem and it is frequently detected in rivers and lakes by NIEA and NI Water at abstraction points in drinking water catchments in NI.

Weed-wiping

What is the solution?

Farmers in NI have traditionally used boom sprayers for apply the herbicide MCPA to rushes. However, trials in conjunction with College of Agriculture, Food and Rural Enterprise (CAFRE) have shown that weed-wiping with glyphosate is a more effective and less pollutant rush control method than using MCPA via a boom sprayer. Using weed-wipers to manage rushes is more effective as herbicide is applied directly to the plant, using less chemical and dramatically reduces spray drift and runoff to water. An innovative trial project has begun under the heading "Rush Solution without Pollution".

Why use Weed-Wipers?

Rushes can be managed by using herbicides applied by either a boom sprayer, knapsack or a weed-wiper. Weed-wipers can manage rushes more efficiently than conventional boom sprayers using less chemical with a dramatic reduction in spray drift. Weed-wipers are only licensed for use with glyphosate, a chemical that has potentially less impact on water quality as it can break down quicker in around 3-7 days compared with MCPA, which breaks down in 3-4 weeks. Greenmount CAFRE has held demonstrations at Glenwherry Hill Farm where plots of rushes were controlled using a number of different methods including mechanical cutting, weed-wiping with glyphosate, cutting and weed-wiping the regrowth with glyphosate and boom spraying with MCPA.

This demonstrated that the area cut and later weed-wiped with glyphosate showed the most effective rush control with minimal water pollution. This method uses a glyphosate product specifically approved for use in a weed-wiper. The percentage of rush cover reduced from 81 per cent in 2014 to 20 per cent in 2015. Based on these findings this project intends to trial this method of rush control in the Seagahan Catchment area. Weed-wipers are an effective method to use whilst managing rush infestations and other grassland weeds, and pose a lower risk to quality water.

How will the project work?

As a trial project NI Water are carrying out a weed-wiping project in Seagahan WTW drinking water catchment area in Co Armagh. NI Water is working with The Water Catchment Partnership and the farming industry as part of an innovative campaign to help reduce levels of MCPA in the Seagahan Reservoir catchment area. It is planned to offer a free weed-wiping service using glyphosate, as an alternative to spraying MCPA, to demonstrate an alternative effective rush control method which causes less pollution.

The overall aim is to show that pesticide levels can be reduced in the reservoir without the need for more expensive water treatment processes. This can then be used as a test project to demonstrate the benefits of NI Water working together with farmers and possibly doing more of these type of initiatives in future in other areas. The project will have a Farm Liaison Officer working with farmers and land managers to manage the weed-wiping and promote better advice on handling, applying and disposing of grassland sprays, guidance on mechanical control of rushes and improving land condition to addressing the underlying causes of infestations. The project will be beneficial in comparing best techniques with other projects in N Ireland and used to inform individual aspects of the INTERREG VA Source To Tap project and other SCaMP NI projects going forward to ensure value for money in effectively reducing MCPA levels in watercourses.

The input from the Water Catchment Partnership

The 2-year project will be managed by NI Water but will be carried out in conjunction with the Water Catchment Partnership. This involves representatives from Ni Water, Ulster Farmers Union (UFU), NIEA, Department of Agriculture, Environment and Rural Affairs (DAERA), CAFRE and the Voluntary Initiative. All of these stakeholders will input knowledge and expertise which are vital to the success of the project and their cooperation and assistance is appreciated and valued by NI Water. The aim of the WCP is to deliver one message incorporating the ethos from all organisations to effectively tackle the problem of pesticides in the water environment, particularly in Drinking Water catchment areas, communicating with householders and farmers to raise awareness and provide best practice guidance on grassland pesticide use.

NI Water is working with The Water Catchment Partnership and the farming industry as part of an innovative campaign to help reduce levels of MCPA in the Seagahan Reservoir catchment area.

Project Benefits

The project will bring the following benefits for NI Water:

- Reduced risks of DWI enforcement by demonstrating a proactive approach in the fight against MCPA
- Improve Water Quality Compliance in Seagahan catchment
- Improve Water Quality Compliance in other catchments across NI by raising awareness
- Reduced capital costs at WTW's for MCPA removal
- Reduce operational costs at WTW's for MCPA removal
- Influence and change pesticide use practices to create a lasting legacy
- Build relationships with key stakeholders
- Environmental benefits for aquatic habitats and ecosystems

Environmental Management System (EMS) and ISO14001

In carrying out our core business NI Water contributes to and relies upon the quality of the natural environment, and we strive to protect it by working in an environmentally responsible manner, demonstrating high standards of environmental care and operational performance. NI Water works toward a 'Zero Harm' ambition, which includes avoiding harm to our environment.

NI Water is proud of its achieved maintenance of and compliance with the international standard ISO14001 for our Environmental Management System (EMS). The continual improvement and hard work of our functional staff and business areas, ensures NI Water maintains a strong environmental focus and management compliance as evidenced through its testing our internal audit plan, and by frequent independent external auditors. Our accreditation to the ISO standard has been managed and maintained since 2003. Our CEO, Board and Executive Committee support and approve NI Water's Environmental Statement and continued commitment to protecting, preserving and improving our natural environment.

NI Water's Environmental Management System (EMS) has become an integral part of our daily activities and business processes.

NI Water is proud of its achieved maintenance of and compliance with the international standard ISO14001 for our Environmental Management System (EMS).

Water Mains Rehabilitation

NI Water is a customer focused but asset based organisation. In order to deliver the maximum level of customer service at the lowest sustainable cost, it is important that NI Water assigns expenditure in the most effective possible manner.

The Water Mains Rehabilitation Programme for Northern Ireland was established in 1999 to ensure the investment in water mains infrastructure was appropriately targeted at those areas of greatest need to ensure delivery of a reliable supply of compliant quality water to the people of Northern Ireland and comply with the statutory and regulatory standards set out in the Water Supply (Water Quality) Regulations (NI) 2007 as amended.

The performance and condition of the water mains were investigated and assessed through a series of Detailed Zonal Studies against standard criteria developed in conjunction with various internal stakeholders and DWI. This zonal study approach was used during the PC10 and PC13 planning periods.

In preparation for the PC15 business plan (covering 2015 – 2021), NI Water revised its approach to identifying Water mains investment needs. In consultation with external stakeholders such as the DWI, the Utility Regulator and the Consumer Council Northern Ireland, NI Water developed the Water mains Infrastructure Investment Methodology (WIIM). Building on the basis of the previous Zonal Studies approach which provided solid analysis of structural and water quality issues, the revised approach draws on corporate data, focusing on customer contacts and customer preferences when identifying and prioritising investment needs.

The Water Mains Rehabilitation programme delivered 449km of mains in the PC13 period (2013 – 2015) and if fully funded, should deliver approximately 900km during the PC15 period.

NI Water Customer targets, for drinking water compliance, are set to assist the company in improving the customer experience as well as to facilitate improvement in Regulatory compliance with lead, iron and turbidity. The long term aim, of improving both the customer experience and Regulatory compliance, in relation to these 3 parameters, lies with replacement / refurbishment of the drinking water distribution system.

The Water Mains Rehabilitation Programme for Northern Ireland was established in 1999 to ensure the investment in water mains infrastructure was appropriately targeted at those areas of greatest need.

Sufficiency of Supply

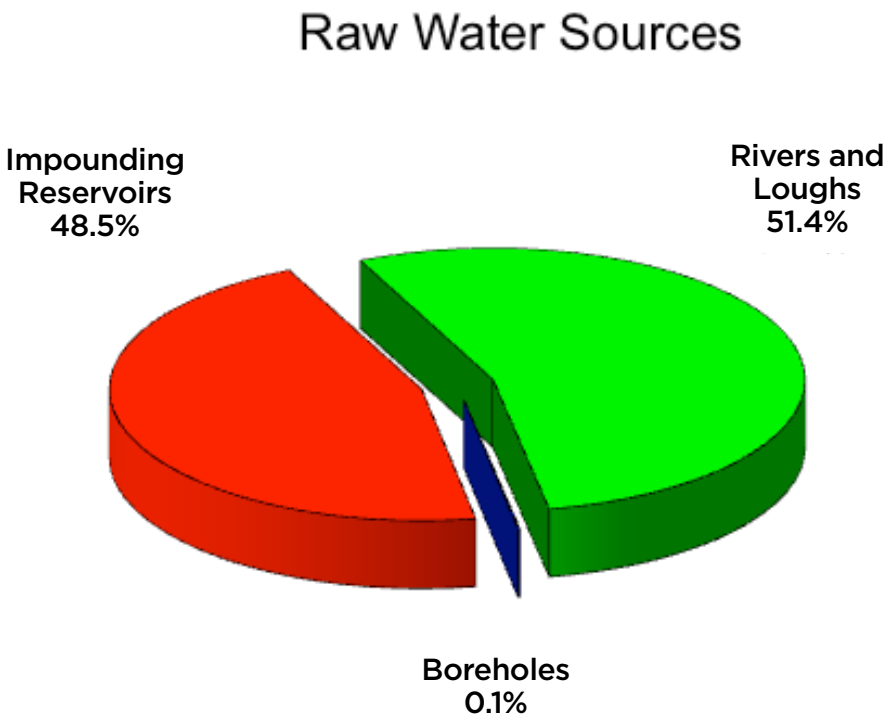
Approximately 852,000 domestic, agricultural, commercial and business properties in Northern Ireland are connected to the public water supply – this equates to around 99.9% of the total population. This entailed supplying an average of about 562 million litres of high quality drinking water to customers every day during 2016. For this NI Water utilised 38 sources which include upland Impounding Reservoirs, Boreholes, Rivers and Loughs.

The Water and Sewerage Services (Northern Ireland) Order 2006 requires NI Water to prepare and maintain a Water Resource Management Plan (WRMP) to indicate how water resources will be developed and managed to enable the undertaker to meet its obligations. The Order requires NI Water to review the plan on an annual basis and prepare a revised plan every 5 years or when there is a material change in circumstances.

NI Water completed a WRMP to meet this obligation and published this in March 2012.

Following completion of the WRMP the Department for Regional Development (DRD), the Utility Regulator (formerly NIAUR) and NI Water agreed to combine the WRMP and Drought Planning process into a single document, and then produce one plan on a rolling 6 yearly programme.

The plan will be entitled the "Water Resource and Supply Resilience Plan" (WR & SR Plan). It will set out how NI Water intends to maintain the balance between supply and demand for water over the long term, and the operational and management options and activities available to respond to short term critical events such as droughts and freeze-thaw issues. NI Water has completed work on the development of the plan in conjunction with a stakeholder steering group. The draft plan will be consulted upon when ministerial approval is granted.



Drinking Water Inspectorate - Technical Audit

The DWI, a unit within the Northern Ireland Environment Agency, has an independent responsibility to audit drinking water quality compliance against the standards set in the Regulations.

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

- The transfer, to DWI, of analytical results of samples taken throughout the year, from water treatment works, service reservoirs and customer 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.

In 2016/17, the technical audit inspection programme included:

- An audit of Donegore SR
- An audit of the Laboratory Information Management System (LIMS)
- An audit of Dungonnell WTWs
- An audit of Caugh Hill WTWs

DWI made a number of recommendations and suggestions and NI Water has followed up on these issues. DWI will report on the inspections and the quality of water supplied by NI Water in its annual report, due to be published later in the year. DWI is located at Klondyke Building, Cromac Avenue, Gasworks Business Park, Lower Ormeau Road, Belfast BT7 2JA.

Water Quality Events

NI Water is required under the Drinking Water Regulations to notify the DWI whenever an event occurs that has the potential to impact on drinking water quality. NI Water fully investigates all events and provides the DWI with a substantive report for each. After investigation the event may be shown not to have had a detrimental effect on water quality and is classified in the "Drinking Water Inspectorate's Report" as "Not Significant" or "Minor" as opposed to "Significant", "Serious" or "Major".

A full list of all Water Quality Events notified to the DWI during 2016 is detailed in Appendix 4.

Example Events

Boil Water Notice issued to a single property following microbiological exceedances

A routine water quality audit sample taken on 4th March 2016 at a food preparation premises was found to be unsatisfactory for the microbiological parameter Total Coliforms.

A repeat sample taken the following day at the same property, as part of our follow up investigation, was also found to be unsatisfactory for Total Coliforms. Samples taken as part of the investigation at other nearby properties and at the supplying Service Reservoir were found to be satisfactory, showing that the water supply to the property was satisfactory. As part of our investigation a bacteriological swab of the customer tap is taken to determine if the tap is contaminated and potentially in an unhygienic condition. The analysis of the tap swab showed a positive growth of bacteria present showing that the tap was contaminated and in an unhygienic condition.

The results of the samples and details of the investigations carried out into the cause of the failures was reported to the PHA as is required under our reporting procedures. The PHA advised that a Boil Water notice should be issued to the premises until remedial action was taken by the owners to prevent further microbiological exceedances. The local Environmental Health Office was also informed and they visited the premises to provide advice on actions to be taken.

The tap was replaced with a new tap and further water quality samples were taken by NI Water following completion of this work. The follow up samples were found to be satisfactory and the PHA advised that the Boil Water Notice at the property could be removed.

This Event shows the importance of ensuring that taps used for drinking water purposes are kept clean and in a hygienic condition. It is important that you regularly clean taps that are, or may be, used for drinking water. Bacteria and other microorganisms occur naturally and are found within our homes. Under certain conditions these can grow both on the outside of the tap and inside the lip of the spout. They are not visible to the naked eye, but the tap can become contaminated from food or items washed in the sink or basin. For this reason, you should never allow food to come into contact with the end of the tap.

Tips to keep your tap clean and free from bacteria

- Regularly clean household taps thoroughly using a dilute bleach solution, ensuring that you wash inside the spout.
- After cleaning the tap, run it for a few moments to remove any remaining disinfectant.
- To prevent possible contamination do not leave items such as flannels and dishcloths on the tap to dry and never allow food or animals to come into contact with taps.

Loss of primary disinfection at Dungonnell WTW

This Event was notified to the DWI following loss of the primary method of disinfection of the final water going into supply from Dungonnell WTW.

The problem was quickly identified by an automatic alarm. The alarm is in place to ensure that action is taken immediately on site and to ensure that water quality to our customers is not impacted. Disinfection of the water supply was maintained by bringing an alternative disinfection system into operation at the treatment works. The alternative disinfection system was used until work was completed to bring the primary system back into operation.

Water quality was not impacted by this Event and drinking water supplies were maintained to customers.

Regulatory Enforcement

DWI put in place one "Provisional Enforcement Order" (PEO) during 2016:

- PEO 16/01 - to seek remedial measures relating to contraventions of the pesticide, MCPA [(4-Chloro-2-methylphenoxy) acetic acid], from water supplied from Derg WTWs was issued on the 24/03/2016. DWI accepted and published a series of Undertakings from NI Water on the 30/06/2016. These Undertakings are scheduled to run through until 31/03/2019.

One "Consideration of Provisional Enforcement Order" (CPEO) was closed during 2016:

- CPEO 15/01 - to seek remedial measures relating to contraventions of the pesticide, MCPA [(4-Chloro-2-methylphenoxy) acetic acid], from water supplied from Derg WTWs. Closed 16/01/16 following the completion of undertakings.

The Regulations require water quality to be monitored using analytical systems which can demonstrate that appropriate accuracy is achieved and maintained. NI Water attaches great importance to the integrity of the analysis and for this reason applies strict laboratory analytical quality control procedures. These systems and procedures are subject to external inspection and audit by the DWI and an assessment of NI Water's performance is included in the Inspectorate's annual report.

NI Water has achieved the requirements of the Drinking Water Testing Specification, (DWTS). This is a national scheme agreed between the DWI and the United Kingdom Accreditation Service (UKAS) for quality assurance within laboratories carrying out analysis for the water industry.

In addition to this, both of NI Water's Testing laboratories have attained the necessary standard of analytical excellence and have been awarded UKAS accreditation under ISO 17025. UKAS auditors carry out an annual audit of the NI Water laboratories' quality system.

In order to rapidly detect Cryptosporidium oocysts NI Water has a Cryptosporidium Analytical Unit at its Altnagelvin Laboratory. This Unit has DWI approval and is instrumental in the development of new accredited methods for the water industry. This unit has also been awarded UKAS accreditation.

NI Water laboratories provide an accredited analytical service to external customers for both drinking water quality testing and wastewater quality testing.

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

Use of Technology for Increased Assurance

To assist in its ability to audit its sampling programme, NI Water has put in place a ruggedised tablet PC (Toughpads) based system to produce an enhanced audit trail and to eliminate data transcription errors.

The system uses Toughpads which incorporate mobile phone technology for communication. A built in barcode scanner is used to scan the labels on the sample bottles and GPS (Global Positioning System) is used to give an accurate location fix and time for each sample as it is collected. As the sampler returns to the laboratory, this data is downloaded with all the ancillary audit data onto NI Water's Laboratory Information Management System (LIMS) where it updates the existing sample information. This system has recently been upgraded to more fully automate the audit trail and chain of custody.

Within the laboratory environment the majority of analytical results are transferred directly into LIMS via direct data capture from the laboratory instrumentation. This information transference minimises the possibility of transcription errors and again gives an enhanced audit trail.

Water Quality Summary

NI Water Sites in Service

During 2016, the numbers of NI Water sites in service were:

Location Type	Number in Service
Water Treatment Works	25
Service Reservoirs	294
Water Supply Zones	51
Authorised Supply Points (see glossary)	25

Overall Water Quality Testing

During 2016 99,506 microbiological, physical and chemical tests were carried out for mandatory and indicator consented parameters on water samples taken from water treatment works, service reservoirs and customer taps in the year 2016. Of these, 99,367 tests complied with the regulatory standards giving an overall percentage compliance of 99.86%.

Location Type	No of Samples	Regulatory Parameters Analysed	Regulatory Parameters used for Compliance Assessment
Raw Water Source	199	4,297	0
Water Treatment Works	6,380	44,887	19,367
Service Reservoir	15,213	91,278	30,426
Zone (including Authorised Supply Point)	7,464	64,019	49,713
Overall	**29,256**	**204,481**	**99,506**

As well as the regulatory required analyses, NI Water also carries out a large number of operational process control determinations, to ensure that its treatment processes are fully optimised.

Microbiological Quality

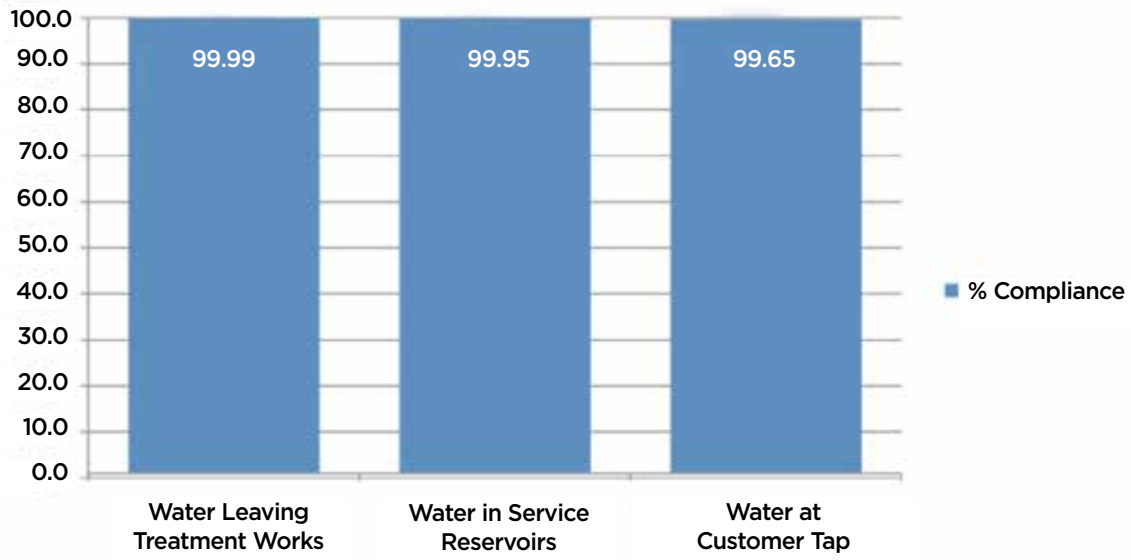
Water leaving water treatment works is disinfected with chlorine to safeguard public health by destroying microorganisms. This is the most important part of the water treatment process. NI Water has developed a disinfection policy for water treatment and individual disinfection statements for each water treatment works. This will continue to ensure that all water supplied by NI Water is adequately disinfected, and water supplied to customers is safe and pathogen free.

To ensure the effectiveness of the treatment and chlorination process, the wholesomeness of treated water is regularly examined to ensure the absence of total coliforms and faecal coliforms (E. coli) at water treatment works, service reservoirs and in the distribution system at customer taps. 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 customer taps are due to contamination of the tap itself, in particular with mixer type 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. If the contamination is found to be due to the tap or internal plumbing NI Water will inform the customer in writing of the reason for the failure so that they can take appropriate action. A copy of the letter is also provided to the PHA, the local Environmental Health Officer and the DWI.

A summary of the microbiological quality of water supplied in 2016 is given below.

Overall Microbiological Water Quality



Physical and Chemical Quality at Customer tap

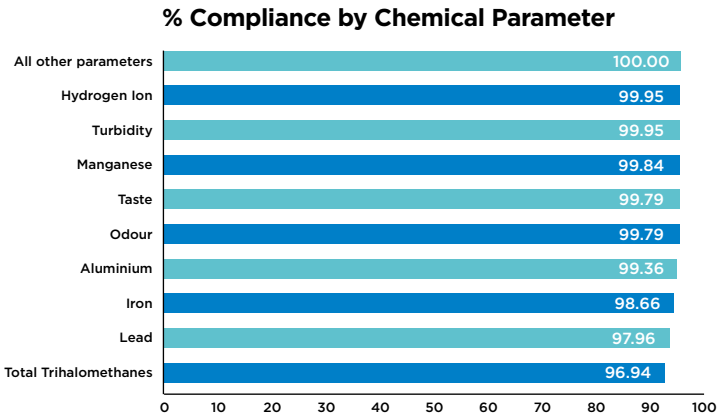
Physical and chemical quality standards apply to water supplied at customer taps. The Regulations lay down the required sampling frequency for each parameter or group of parameters dependent on the resident population of the water supply zones.

- During 2016 36,686 physical and chemical tests were assessed against their consent for water samples taken at customer taps or authorised supply points in the year 2016. Of these, 36,613 tests complied with the regulatory standards giving a compliance of 99.80% for physical and chemical tests.

Appendix 2 shows the extent of NI Water'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 NI Water'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.

Explanatory notes of exceedances of the microbiological and chemical quality standards with less than 100% compliance are provided in the following section.

Overall Water Quality			
	Number of Analytical Tests	**Number of Tests Exceeding PCV**	**% Compliance with Regulatory Standards**
Water Leaving Treatment Works			
Bacteriological Analysis	12,760	2	99.98
Indicator parameters	6,607	7	99.89
Total	**19,367**	**9**	**99.95**
Water in Service Reservoirs			
Bacteriological Analysis	30,426	15	99.95
Total	**30,426**	**15**	**99.95**
Water at Customers' Taps or Authorised Supply Points			
Bacteriological Anal. inc Coliforms	13,027	42	99.68
Zone Chemical Analysis	21,700	69	99.68
Supply Point Chemical Analysis	8,124	3	99.96
Indicator parameters	6,862	1	99.99
Total	**49,713**	**115**	**99.77**
Total Mandatory Parameters	**86,037**	**131**	**99.85**
Total Indicator Parameters	**13,469**	**8**	**99.94**
Overall Water Quality Total	**99,506**	**139**	**99.86**



During 2016 the following main chemical parameters exceeded their prescribed concentration or value at some point.

Aluminium

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 regularly reviewed and upgraded where required to lower the aluminium levels to below regulatory levels.

Iron

The iron standard has been set for aesthetic reasons as levels persistently above the standard can give rise to discoloured water and particulate matter. Where the standard for iron has not been met, this may be due to problems of corrosion of iron water mains. There is an ongoing proactive programme of flushing and cleaning of the distribution system to minimise the problem. In addition, NI Water has an ongoing Water Mains Rehabilitation Programme in which supply zones that 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 customer complaint information and the implementation of targeted water quality 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 water mains cleaning and renovation and replacement of parts of the distribution system. Implementation of the solutions is undertaken either by NI Water or its contractors.

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 water main and the kitchen tap or in domestic plumbing, there may be a risk of concentrations at the customer 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, the customer, the PHA, the local Environmental Health Officer and DWI are notified. Where it is found that the exceedance is attributable to a lead service pipe NI Water will replace free of charge, any of its lead pipes supplying the property. It will be the responsibility of the property owner to replace any lead pipework on the property.

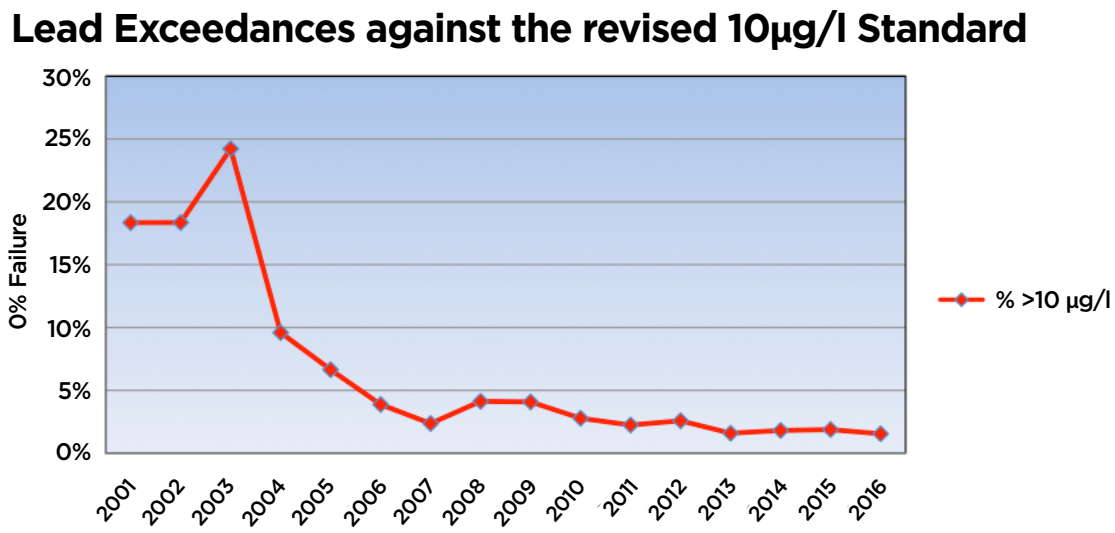
NI Water will also replace free of charge, any of its lead pipes supplying a property, if it receives a written request from a customer who has replaced the portion of lead service pipe for which the householder is responsible.

Where water mains are being rehabilitated, NI Water replaces any lead communication pipes encountered to the boundary of the property and the property owner is informed in writing.

The lead PCV (Prescribed Concentration or Value) reduced significantly from the old limit of 25µg/l to the current limit of 10µg/l at the end of 2013. All non-borewell supplies in Northern Ireland are treated with a small amount of orthophosphoric acid, which forms a protective coating over lead pipes, to minimise levels of lead in the water supply. This dosing is reviewed annually for each water treatment works and agreed with the DWI.

Water Quality Issues

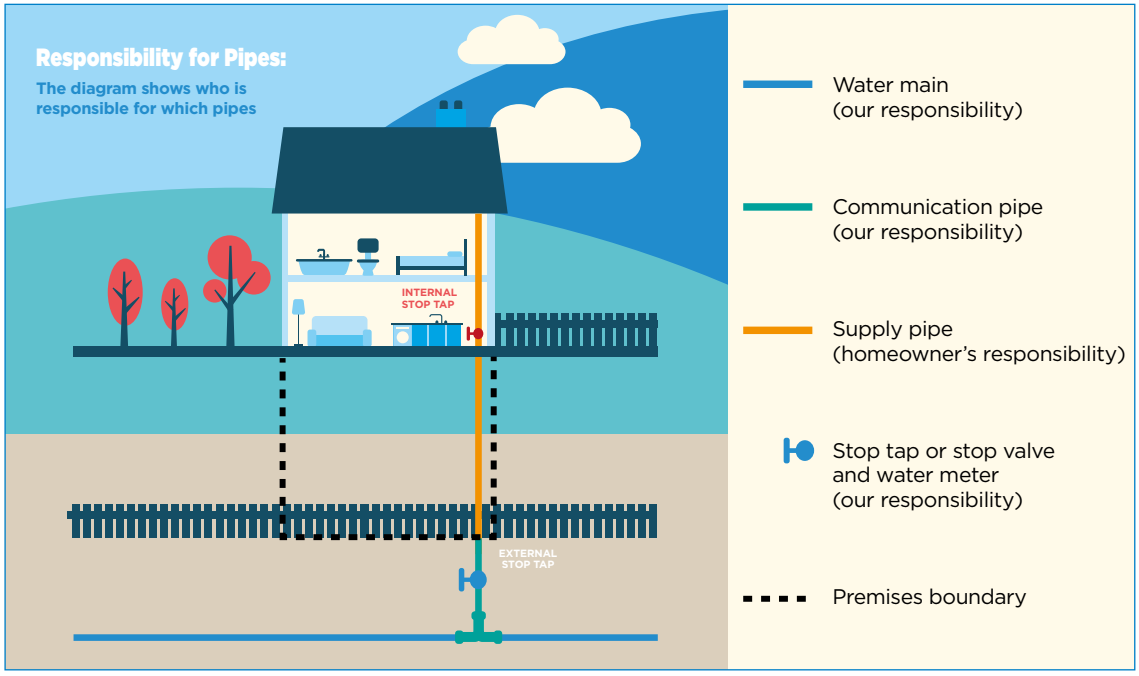
The effectiveness of the dosing can be seen in the graph below, showing the optimisation of the dosing from the water treatment works to meet the new regulations.



A leaflet on lead in drinking water is available from the NI Water website at

www.niwater.com/about-your-water

Amongst other details, this leaflet explains who is responsible for replacing each part of the lead in the domestic system.



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.

Pesticides

Pesticides include insecticides, herbicides, fungicides and algaecides. These can find their way into watercourses from a variety of sources, mainly from use in agriculture or weed control. NI Water has an ongoing pesticide monitoring programme and analysed samples for 34 individual pesticides during 2016. NI Water liaises with other regulatory bodies in Northern Ireland such as the NIEA regarding the control of pesticide usage. The pesticide exceedances were for two of the more commonly used pesticides – MCPA and Clopyralid.

NI Water is engaged on an ongoing series of catchment management plans as part of its overall DWSPs which include looking at pesticide usage and control. The Water Catchment Partnership mentioned previously, has been setup to address pesticide problems across Northern Ireland and raise awareness of the risks of using pesticide products close to drinking water abstraction sources.

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 by disinfection using chlorine is NI Water's main priority. NI Water's water abstractions are predominantly drawn from surface sources, which can contain these natural organic materials.

THM formation is dependent on a wide range of differing factors and so changes in THM concentrations may be a consequence of one or many factors. THM levels tend to increase with pH, temperature, contact time, residence time, length of the distribution network, and the level of "precursors" present. Precursors are the organic material which reacts with chlorine to form THMs.

During 2016 we saw an increase in the number of THM sample failures from previous years. These failures were due to a number of factors, including some treatment related issues, which reduced the organic removal performance through the treatment process, and distribution system impacts from residence time in the distribution system along with higher mains water temperatures recorded during 2016.

We have developed and put in place ongoing THM action plans to reduce the risk of THM failures. These action plans alongside our DWSP risk assessment process are used to help identify where investment may be required to reduce the risk of THM failures. NI Water's ongoing water treatment works investment programme is designed to provide improved treatment to reduce organic matter prior to chlorination and thereby reduce THM levels.

In addition to its ongoing programmes of work, NI Water is constantly reviewing its operational procedures to reduce THM levels in the distribution system, whilst maintaining microbiological quality. Improved compliance over all of Northern Ireland is expected as improvements to water treatment works and the distribution system continue.

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.

Summary

All exceedances of the regulatory standard are investigated following procedures agreed with the Health Authorities and the DWI. Closure of an event cannot take place without their approval.

Further information

Various information leaflets giving more details of water information may be found at **www.niwater.com/about-your-water**

Asset Management and Delivery

In October 2014 the Minister for Regional Development provided Social and Environmental Guidance which outlined the priorities for investment for NI Water for the period April 2015 to March 2021 (PC15). From this, the Utility Regulator for Northern Ireland set a % Overall Water Quality Compliance target of not less than 99.79% for water quality during this period. NI Water developed the PC15 business plan to maintain the quality of water through the investment period. The water quality section of the PC15 plan included the laying of 905km of new, renewed or relined water mains, the provision of 3 strategic trunk mains, the upgrading of water treatment works, service reservoirs and pumping stations.

However, due to public sector funding constraints, the original investments planned for the first two years of PC15 have had to be reduced. This has had an impact on the investment available for water maintenance and enhancement projects. The capital programme for the first two years of PC15 has been reduced by £26.4m. As a result the 2015/16 regulatory target for water mains was reduced from 130km to 93km, against which 117km was delivered. The 2016/17 target remained unchanged at 144km against which 172.27km was actually delivered. The availability of publically funded capital will dictate the level of investment going forward and the number of water schemes which will be completed.

These planned investments would aim to maintain and locally improve our water quality compliance as well as improving levels of service to customers for example, for customers suffering low water pressure. In addition to the investment targeted at improving the quality of service, capital investment is also allocated towards maintaining the serviceability of our assets, now and in the future. The success of these aims will depend on the availability and priority of capital for investment in the drinking water sector.

NI Water operates an integrated asset management system to ensure this investment is properly targeted towards the maintenance of existing assets and the prioritisation of customer needs. In the water mains programme the introduction of the WIIM has allowed NI Water to prioritise expenditure more effective and help maximise benefits for customers.

NI Water supplies potable water to all of Northern Ireland. A breakdown of water quality by council area detailing capital investment during the reporting period is given at Appendix 3.

Research, Development and Innovation

NI Water, through its Research, Development and Innovation (RDI) section, undertakes a programme of applying research and technology development. NI Water's RDI investment is targeted to meet business needs by facilitating the transfer of technology and systems developed by others. It is predominantly focussed on incremental innovation, and optimisation i.e. producing more out of existing assets. Innovation, where appropriate, is employed to support the development of standards and best practice, across all of NI Water's activities.

This programme is driven by the desire to maintain and where possible improve water quality, whilst making efficiency gains. It contains projects designed to improve drinking water quality and compliance of our consented discharges while protecting the environment and providing an improved service to our customers.

NI Water, together with other UK Water Companies, employs research bodies such as the United Kingdom Water Industry Research Ltd (UKWIR) to provide a collaborative programme of research. This is tailored to suit the needs of the UK water industry and where required, specifically to suit the needs of NI Water. The research programme covers a wide range of business areas including; Best Practice, Climate Change, Regulation and Sustainability.

The RDI section also manages projects which require industry specialists to provide expertise to bridge knowledge gaps and solve problems specific to NI Water. Through the RDI section NI Water collaborates with, and supports local and UK university research.

Water Supply (Water Fittings) Regulations (NI) 2009

Water Regulation Background

NI Water was granted an operating license to provide water and sewerage services in Northern Ireland on 1st April 2007, replacing the former Water Service which was an executive agency within the former Department for Regional Development (DRD). This change in the delivery of water and sewerage services in Northern Ireland was as a result of new legislation – The Water and Sewerage Services (Northern Ireland) Order 2006 (the 2006 Order).

The Water Supply (Water Fittings) Regulations (Northern Ireland) 2009 (the Regulations) were made by the then DRD under Articles 114 and 300(2) of the 2006 Order and came into operation on 3rd August 2009.

NI Water has an obligation to ensure the Regulations are being complied with and to publish a report on activities associated with customer compliance no later than the 30th June every year.

The Regulations are primarily designed to prevent the waste, misuse, undue consumption, erroneous measurement of water and most importantly to prevent contamination of wholesome water. Owners and occupiers of premises, and anyone who installs plumbing systems or water fittings, have a legal duty to ensure that their systems satisfy the requirements of the regulations. Advance notice must be given, in most cases, of proposed installations, so architects, building developers and plumbers have to follow the Regulations on behalf of future owners or occupiers.

For the purposes of these regulations:

NI Water is obliged to inspect its customer premises for compliance with the requirements of the Regulations. The Department for Infrastructure (DfI) Water and Drainage Policy Division (WDPD) is deemed the Regulator of this activity. Non-compliance may result in the NI Water legal team taking formal enforcement action against customers, NI Water and WDPD meet quarterly to discuss issues arising under the Regulations, compliance activities and contraventions.

The Water Regulation Advisory Scheme (WRAS) list of Standard Industrial Classification (SIC) codes with related fluid categories shall be used to define categories of non-domestic properties.

NI Water's implementation of these regulations is detailed at Appendix 5 herein. Detailed below are the numbers of inspections completed, contraventions observed and contraventions awaiting customer resolutions.

Description	Number
*Number of Domestic and Non Domestic Inspections • Full Inspections. • Revisit Inspection. • Drawings Inspection. Total number of all Inspections	 520 419 8 **947**
*Number of Premises/Bodies visited	947
*Number of Contraventions Active recorded	1066
*Number of Contraventions Closed	786
*Number of Outstanding Contraventions	280
*Number of Inspections with outstanding contraventions > 3 months passed to NI Water Legal Department	9

*2016 Calendar year

Drinking Water Register

A Drinking Water Register is available from NI Water's website at **http://www.niwater.com/water-quality-results** showing the most recent year's detailed water quality results for customers based on their postcode, and also details of water hardness to enable customers to set up dishwashers etc correctly.

If you are unable to access the website, the Register may be requested, free of charge, during normal working office hours through the customer relations centre below. Customers may request 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 address listed below:

Customer Relations Centre
4th Floor
Capital House
3 Upper Queen St
Belfast BT1 6PU

Customers can contact the Customer Relations Centre on our Waterline: **03457 440088**

Customers who have hearing difficulties can also contact us via type talk on: **03457 440088**

Customers may also contact Customer Services by email on: **waterline@niwater.com**
or via Twitter: **@niwnews**

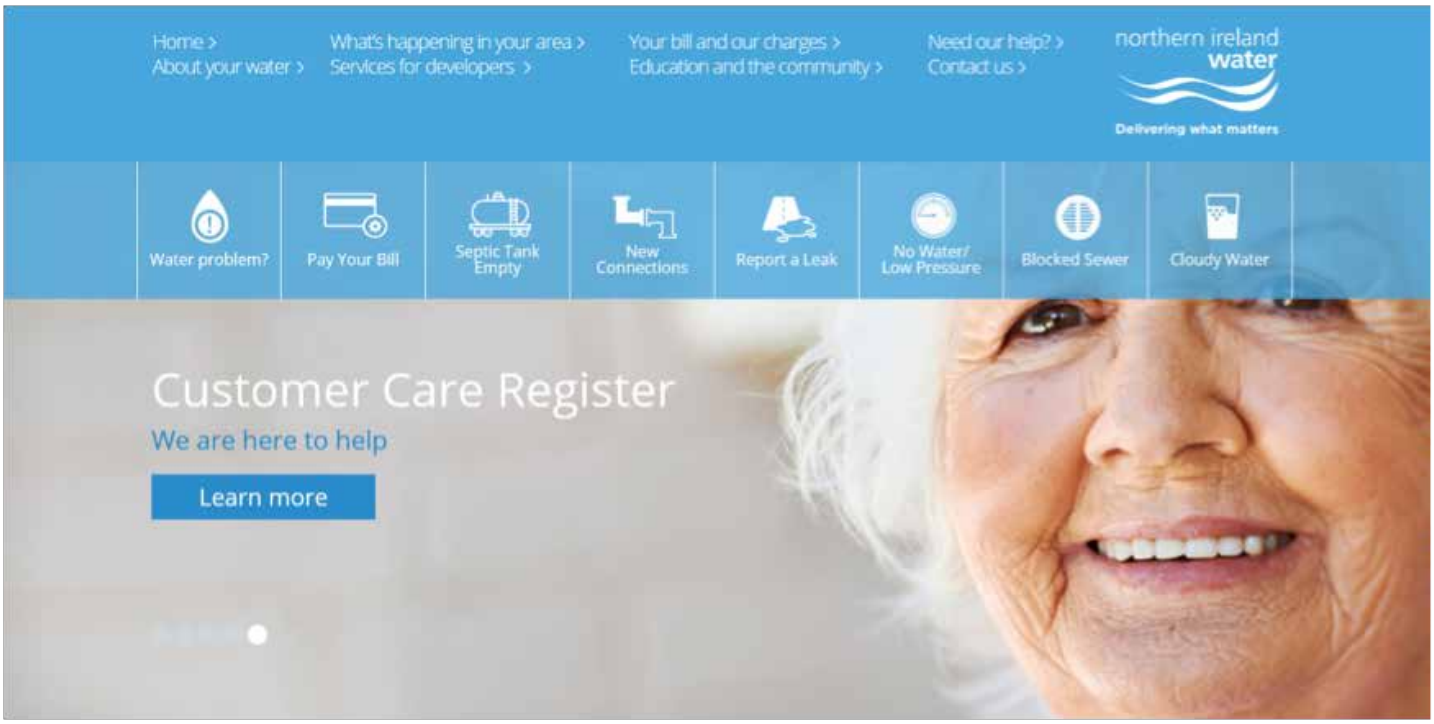
Further information for customers may be obtained at NI Water's website: **http://www.niwater.com**

This site also contains electronic versions of recent Water Quality reports.

Customer Services

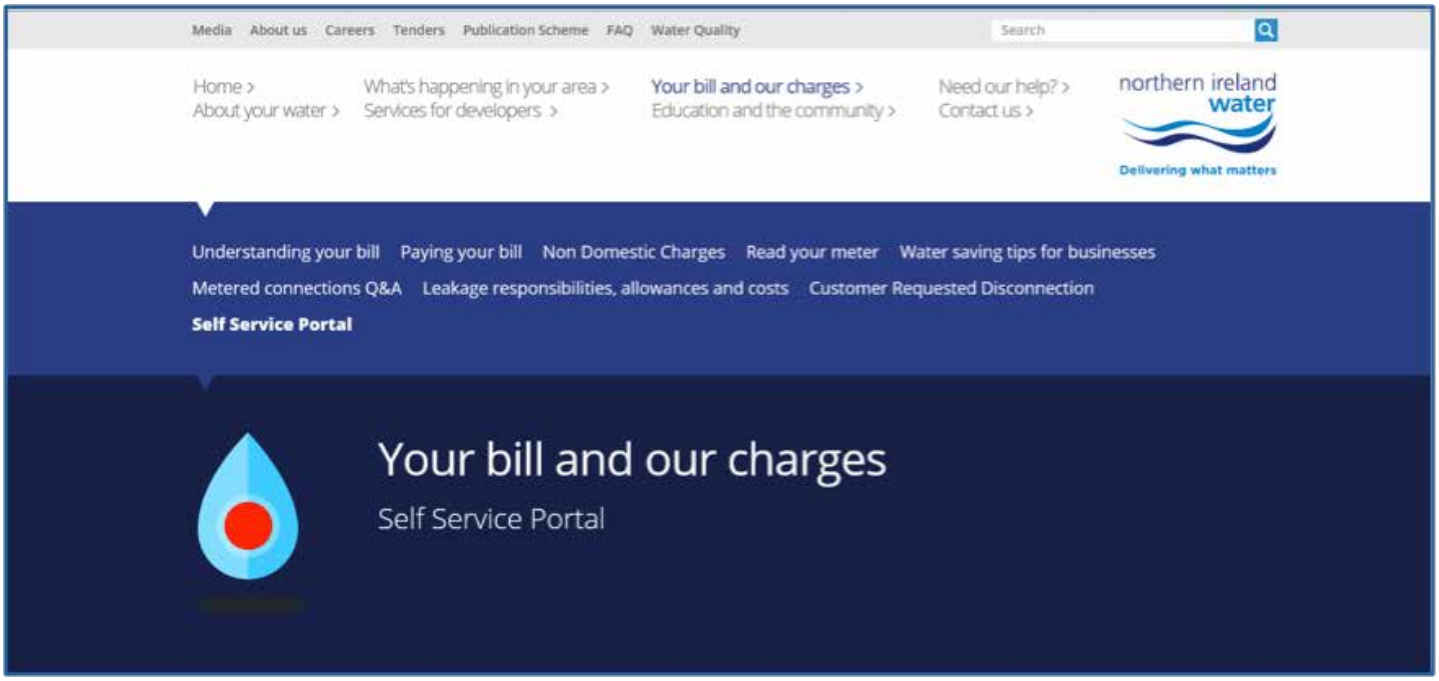
Staff in the Customer Relations Centre record details and the nature of all enquiries, requests for services, emergencies and complaints. All contacts are logged and routed directly to staff who will investigate the matter and resolve the problem as quickly as possible.

Customer Services produces a range of leaflets about services provided, including those designed to give customers the opportunity to learn more about water quality standards, water efficiency and the need to use water wisely. The leaflets can be obtained from the Customer Relations Centre or may be viewed on the above Website at **www.niwater.com/about-your-water**



Self Service Portal

As part of our ongoing efforts to improve the overall customer experience, we have taken steps to make interactions more convenient by developing a web based Self Service platform. This allows customers to log into their personal account online and access their details at a time that is convenient to them.



Once registered, customers are able to:

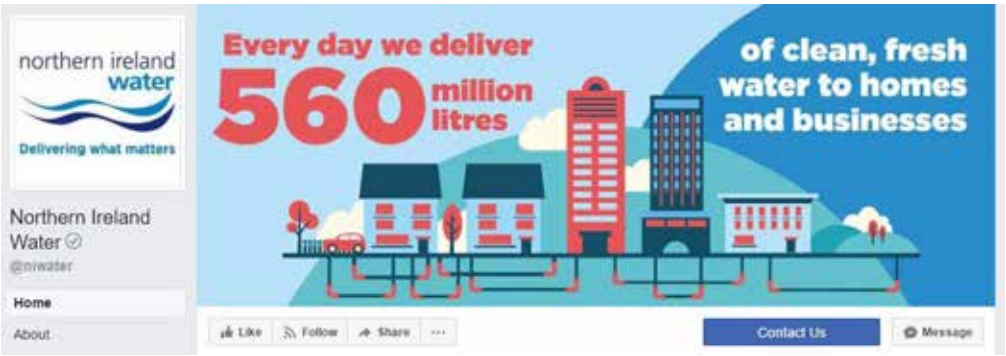
- view their account balance
- view the payment plan of individual schedules
- view bill and payment history
- view desludging request history
- process a new desludging request
- pay a bill
- manage account details
- participate in a live WebChat with a Customer Service advisor

This web portal is found at: **https://www.niwater.com/self-service-portal/**

Social Media

NI Water actively uses social media to interact with and inform its customers. This includes:

Facebook



This is updated on a daily basis and in the event of a major incident will be used to communicate directly with customers.

YouTube

NI Water has its own YouTube channel **https://www.youtube.com/user/northernirelandwater** which hosts NI Water videos such as "How to protect your pipes", "Saving water in the home" or "Protect from Bogus Callers". It can also be used to host video messages for customers during a major incident.

Twitter

NI Water's twitter account is routinely used to respond directly to customers queries at **@niwnews**.

Major Incident Information

In a major incident or emergency situation (such as the sudden flooding following heavy rainfall in recent years) NI Water can experience a massive increase in demand for information by our customers which would overwhelm the normal systems in place.

To increase the number of calls answered and the quality of information provided, NI Water has installed a High Volume Call Answering (HVCA) system. This is an "always on" service which monitors all incoming calls to WaterLine and takes on the additional load during unexpected peaks. The NI Water HVCA system recognises customers using the telephone number held on their customer record or it can use Voice Recognition to allow customers to state their Post Code etc. (Voice Recognition like this is used on many smartphones and call handling systems in banks etc).

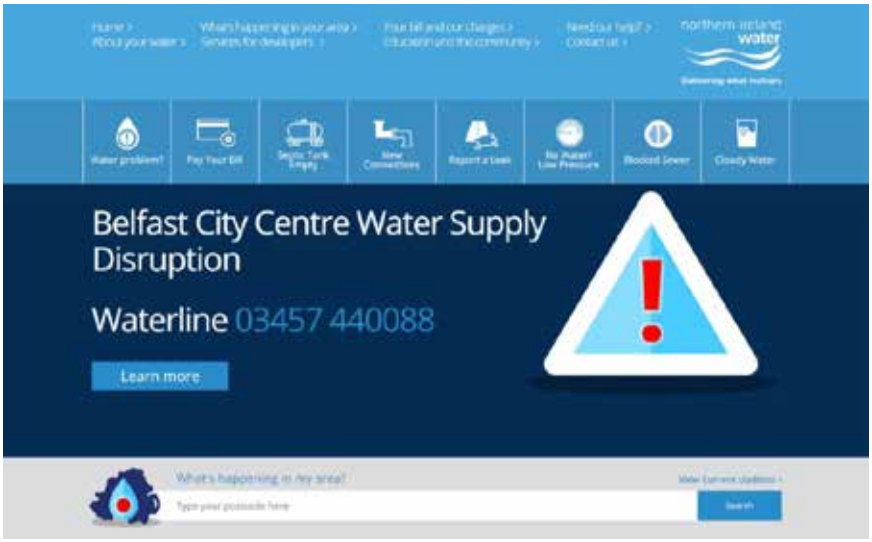
NI Water's customers should have a better experience when they ring us because their call will always be answered, and they should be provided with up to date information.

NI Water's management of the incident will be improved because we will know when, and why, each customer has called. This allows a more detailed picture of the reasons customers are calling and the potential causes to be built up. This technology puts NI Water on a par with other utilities in Northern Ireland and other water companies in the UK.

Major Incident and Major Emergency Website

NI Water's website routinely provides information to its customers regarding interruptions, repairs and planned upgrades as well as frequently asked questions and answers and links to helpful sites e.g. to find a plumber etc.

If a major incident or emergency is declared, NI Water's normal website has the facility to become a dedicated portal for emergency information. This allows customers to quickly find out information based on their postcode.



Information available includes:

- Bursts
- Alternative Water Supplies
- Planned Restrictions to Supply
- Low Reservoir Levels
- Boil Notices

The site support and throughput allows in excess of 200,000 visits per hour by customers.

APPENDICES

Appendix 1

Drinking Water Quality Standards

Water Supply (Water Quality) Regulations (Northern Ireland) 2007 (as amended)

Schedule 1			
PRESCRIBED CONCENTRATIONS AND VALUES			
TABLE A.			
MICROBIOLOGICAL PARAMETERS			
Part I: Directive requirements			
Parameters	***Concentration or Value (maximum)***	***Units of Measurement***	***Point of compliance***
Enterococci	0	number/100ml	Customer taps
Escherichia coli (E. coli)	0	number/100ml	Customer taps
Coliform bacteria	0	number/100ml	Customer taps (i)

Appendix 1

TABLE B.

CHEMICAL PARAMETERS

Part I: Directive requirements

Parameters	*Concentration or Value (maximum)*	*Units of Measurement*	*Point of compliance*
Acrylamide	0.10	µg/l	(ii)
Antimony	5	µg Sb/l	Customer taps
Arsenic	10	µg As/l	Customer taps
Benzene	1	µg/l	Customer taps
Benzo(a)pyrene	0.01	µg/l	Customer taps
Boron	1	mg B/l	Customer taps
Bromate	10	µg BrO3/l	Customer taps
Cadmium	5	µg Cd/l	Customer taps
Chromium	50	µg Cr/l	Customer taps
Copper	2	mg Cu/l	Customer taps
Cyanide	50	µg CN/l	Customer taps
1,2 Dichloroethane	3	µg/l	Customer taps*
Fluoride	1.5	mg F/l	Customer taps
Lead	10	µg Pb/l	Customer taps
Mercury	1	µg Hg/l	Customer taps
Nickel	20	µg Ni/l	Customer taps
Nitrate	50	mg NO3/l	Customer taps
Nitrite	0.5	mg NO2/l	Customer taps
Aldrin	0.03	µg/l	Customer taps*
Dieldrin	0.03	µg/l	Customer taps*
Heptachlor	0.03	µg/l	Customer taps*
Heptachlor epoxide	0.03	µg/l	Customer taps*
Other pesticides	0.1	µg/l	Customer taps*
Total Pesticides (iii)	0.5	µg/l	Customer taps*
PAH - Sum of four substances (iv)	0.1	µg/l	Customer taps
Selenium	10	µg Se/l	Customer taps
Tetrachloroethene/ Trichloroethene – Sum (v)	10	µg/l	Customer taps*
Total Trihalomethanes (vi)	100	µg/l	Customer taps
Vinyl chloride	0.50	µg/l	(ii)

Appendix 1

Notes:

(i) NI Water, with the agreement of the DWI, 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.

(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

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

Part II: National requirements

Parameters	*Concentration or Value (maximum unless otherwise stated)*	*Units of Measurement*	*Point of compliance*
Aluminium	200	µg Al/l	Customer taps
Colour	20	mg/l Pt/Co	Customer taps
Iron	200	µg Fe/l	Customer taps
Manganese	50	µg Mn/l	Customer taps
Sodium	200	mg Na/l	Customer taps
Tetrachloromethane	3	µg/l	Customer taps
Turbidity	4	NTU	Customer taps

Appendix 1

Schedule 2			
INDICATOR PARAMETERS			
Parameters	***Specification Concentration or Value (maximum) or State***	***Units of Measurement***	***Point of monitoring***
Ammonium	0.5	mg NH_4/l	Customer taps
Chloride (i)	250	mg Cl/l	Supply point*
Clostridium perfringens (including spores)	0	Number/100ml	Supply point*
Colony counts	No abnormal change	Number/1ml at 22°C Number/1ml at 37°C	Customer taps, service reservoirs and treatment works
Conductivity (i)	2500	µS/cm at 20°C	Supply point*
Hydrogen ion	9.5	pH value	Customer taps
	6.5 (minimum)	pH value	
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 supply point, as no significant change during distribution.

Explanatory Notes

Measurement Units:
Milligram per litre (mg/l) means one part in a million.
Microgram per litre (µg/l) means one part in a thousand million.

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

Appendix 2

Water Quality Report for Water Supply Zones

Schedule 1 parameters	Units	2016 Samples	No > PCV	% > PCV
Enterococci	No./100ml	392	0	0.00%
E. coli	No./100ml	5172	0	0.00%
1,2 Dichloroethane	µg/l	392	0	0.00%
Aluminium	µg Al/l	1868	12	0.64%
Antimony	µg Sb/l	392	0	0.00%
Arsenic	µg As/l	392	0	0.00%
Benzene	µg/l	392	0	0.00%
Benzo(a)pyrene	ng/l	392	0	0.00%
Boron	µg B/l	392	0	0.00%
Bromate	µg/l	392	0	0.00%
Cadmium	µg Cd/l	392	0	0.00%
Chromium	µg Cr/l	392	0	0.00%
Colour	mg/l Pt/C	1868	0	0.00%
Copper	mg Cu/l	392	0	0.00%
Fluoride	mg F/l	392	0	0.00%
Iron	µg Fe/l	1868	25	1.34%
Lead	µg Pb/l	392	8	2.04%
Manganese	µg Mn/l	1868	3	0.16%
Mercury	µg Hg/l	392	0	0.00%
Nickel	µg Ni/l	392	0	0.00%
Nitrate	mg NO_3/l	392	0	0.00%
Nitrite	mg NO_2/l	392	0	0.00%
Odour	dilution No	1868	4	0.21%
Selenium	µg Se/l	392	0	0.00%
Sodium	mg Na/l	392	0	0.00%
Taste	dilution No	1868	4	0.21%
PAH - Sum of four substances	µg/l	392	0	0.00%
Tetrachloroethene/Trichloroethene - Sum	µg/l	392	0	0.00%
Tetrachloromethane	µg/l	392	0	0.00%
Total Trihalomethanes	µg/l	392	12	3.06%
Turbidity	NTU	1868	1	0.05%

Appendix 2

Indicator parameters		2016 Samples	No > SPEC	% > SPEC
Total coliforms	No./100ml	5172	38	0.73%
Total - Residual disinfectant	mg Cl/l	5172	-	-
Free - Residual disinfectant	mg Cl/l	5172	-	-
Colony Counts 37 (48hrs)	No./1 ml	1868	-	-
Colony Counts 22	No./1 ml	1868	-	-
Ammonium	mg NH_4/l	1868	0	0.00%
Chloride	mg Cl/l	392	0	0.00%
Hydrogen Ion	pH value	1868	1	0.05%
Sulphate	mg SO_4/l	392	0	0.00%

Water Quality Report for Authorised Supply Points

Schedule 1 parameters	Units	2016 Samples	No > PCV	% > PCV
Cyanide	µg CN/l	226	0	0.00%
Pesticides - Total Substances	µg/l	226	0	0.00%
All other analysed Pesticides	µg/l	7672	3	0.04%
Indicator parameters		**2016 Samples**	**No > SPEC**	**% > SPEC**
Clostridium perfringens (sulph red)	No./100 m	2291	4	0.17%
Conductivity	µS/cm 20	2292	0	0.00%
Total Organic Carbon	mg C/l	226	-	-
Total Indicative Dose	mSv/year	25	0	0.00%
Tritium	Bq/l	25	0	0.00%

Appendix 2

Water Quality Report for Water Treatment Works

Schedule 1 parameters	Units	2016 Samples	No > PCV	% > PCV
Total Coliforms	No./100m	6380	2	0.03%
E. coli	No./100ml	6380	0	0.00%
Nitrite	mg NO_2/l	227	0	0.00%
Indicator parameters		**2016 Samples**	**No > SPEC**	**% > SPEC**
Turbidity	NTU	6380	7	0.11%
Total - Residual disinfectant	mg Cl/l	6380	-	-
Free - Residual disinfectant	mg Cl/l	6380	-	-
Colony Counts 37 (48hrs)	No./1 ml	6380	-	-
Colony Counts 22	No./1 ml	6380	-	-

Water Quality Report for Service Reservoirs

Schedule 1 parameters	Units	2016 Samples	No > PCV	% > PCV
Total Coliforms	No./100m	15213	15	0.10%
E. coli	No./100ml	15213	0	0.00%
Indicator parameters		**2016 Samples**	**No > SPEC**	**% > SPEC**
Colony Counts 37 (48hrs)	No./1 ml	15213	-	-
Colony Counts 22	No./1 ml	15213	-	-
Total - Residual disinfectant	mg Cl/l	15213	-	-
Free - Residual disinfectant	mg Cl/l	15213	-	-

Water Quality by Northern Ireland Council Area

This section of the Drinking Water Quality Report is designed to demonstrate water quality by individual council area based on the % Compliance at Customer Tap (including Supply Points) over the water supply zones associated with that council area, as shown on the associated maps.

For monitoring purposes NI Water's supply area is divided into water supply zones. These are areas serving not more than 100,000 people, each of which are normally supplied from a single water supply source or combination of sources. There are areas where owing to topography and dispersal of population, it is not practicable to provide a mains water supply. Currently over 99.9% of Northern Ireland's population receive public water supplies.

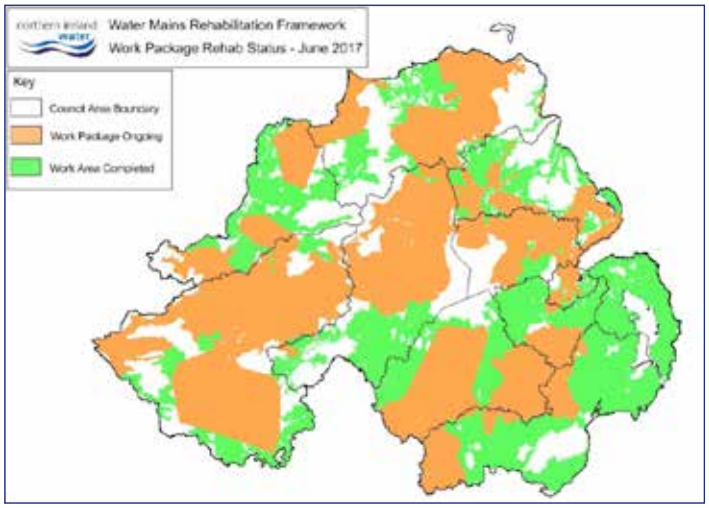
In a number of cases water supply zones overlap council boundaries. The council reports indicate which water supply zones are wholly or partially contained within the council areas, including those zones which may have a relatively small area within the council area. Separation of data within these water supply zones across council boundaries is not practicable, therefore the information used in calculating the zonal compliance relates to the whole zone and not merely the part included within a council boundary. Following discussions with the DWI, water supply zones with fewer than 40 properties within the council area have not been used to calculate the individual council compliance. The information is based on samples taken randomly from customer taps in each water supply zone and from planned samples at authorised supply points. Due to the nature of random sampling, there may be fluctuations in water quality across the water supply zones.

The report also details Capital Work Programmes affecting the council area which directly related to water quality during the reporting period.

Small variations in water quality compliance performance occur across Northern Ireland. This reflects the need to continue to invest in and to maintain water treatment works, and to improve the water mains network.

NI Water has identified the need to deliver a significant volume of water mains rehabilitation and other works across its ageing network. The works are necessary to ensure the efficient and cost effective operation of its water supply system in the immediate future and longer term as well as ensuring adequate levels of water quality and customer supply. To achieve this goal, NI Water has implemented a Water mains Rehabilitation Framework, within which it undertakes work on a Northern Ireland wide basis as identified by the zonal study programme of work.

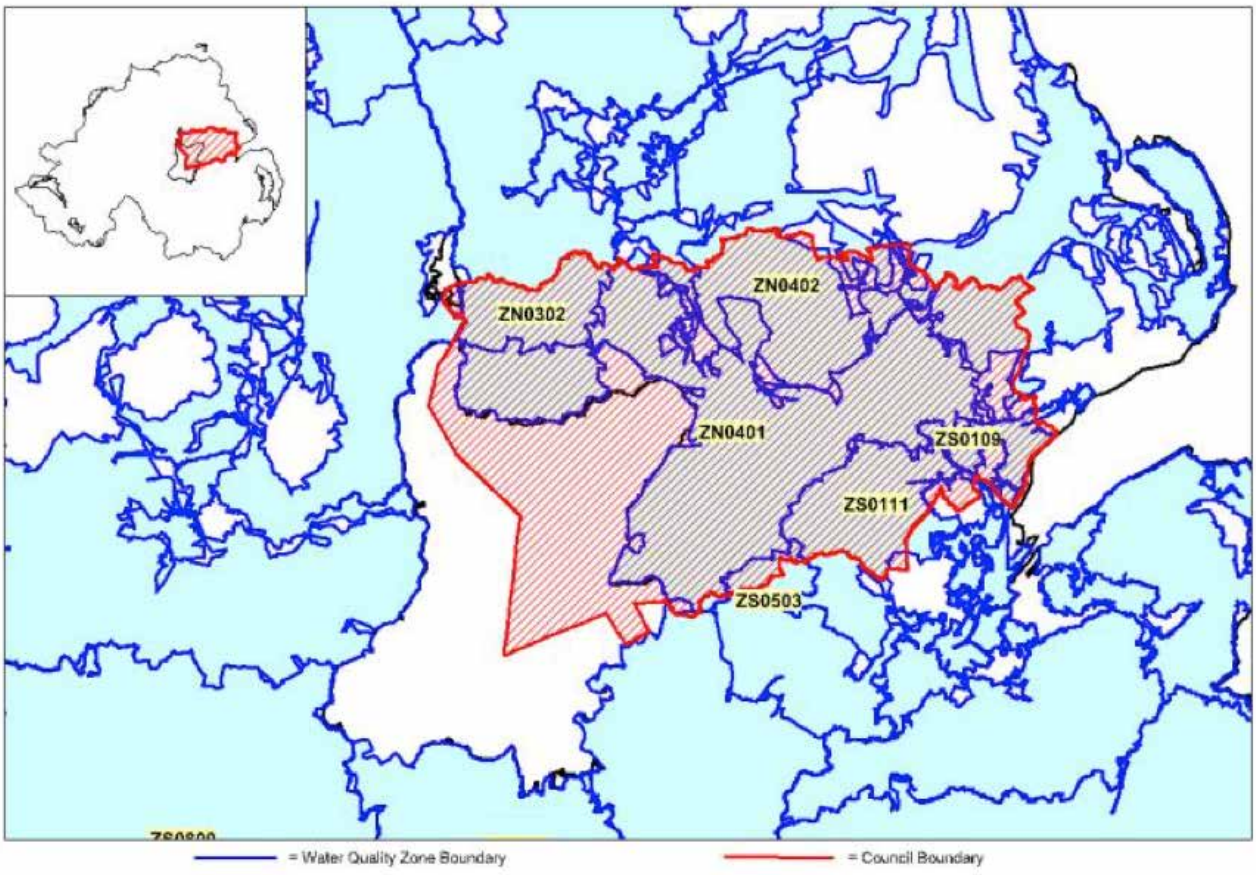
Water Mains Rehabilitation Framework
Current Work Package Status



The map above shows the extent of the current Water mains Rehabilitation Framework covering most of Northern Ireland. To assist clarity, whilst the council boundaries are shown, the individual councils are not named. Regions in white on the map are largely watercourses or upland areas which do not receive public water supply.

Appendix 3

Antrim and Newtownabbey Borough Council



% Compliance at Customer Tap (including Supply Points)

	Target	2013	2014	2015	2016
Overall Northern Ireland Compliance	99.7%	99.7%	99.8%	99.7%	99.8%
Antrim and Newtownabbey Compliance	99.7%	99.8%	99.8%	99.8%	99.7%

2016 water supply zones wholly or partially within the council area:

Zone Code	Zone Name	Zone Code	Zone Name
ZN0302	Dungonnell Glarryford	ZS0109	Dorisland Whiteabbey
ZN0401	Dunore Point Antrim	ZS0111	Dunore Point Hydepark
ZN0402	Killylane Ballynure	ZS0201	Dorisland Carrick
ZS0106	Dunore Belfast North	ZS0503	Forked Bridge Stoneyford

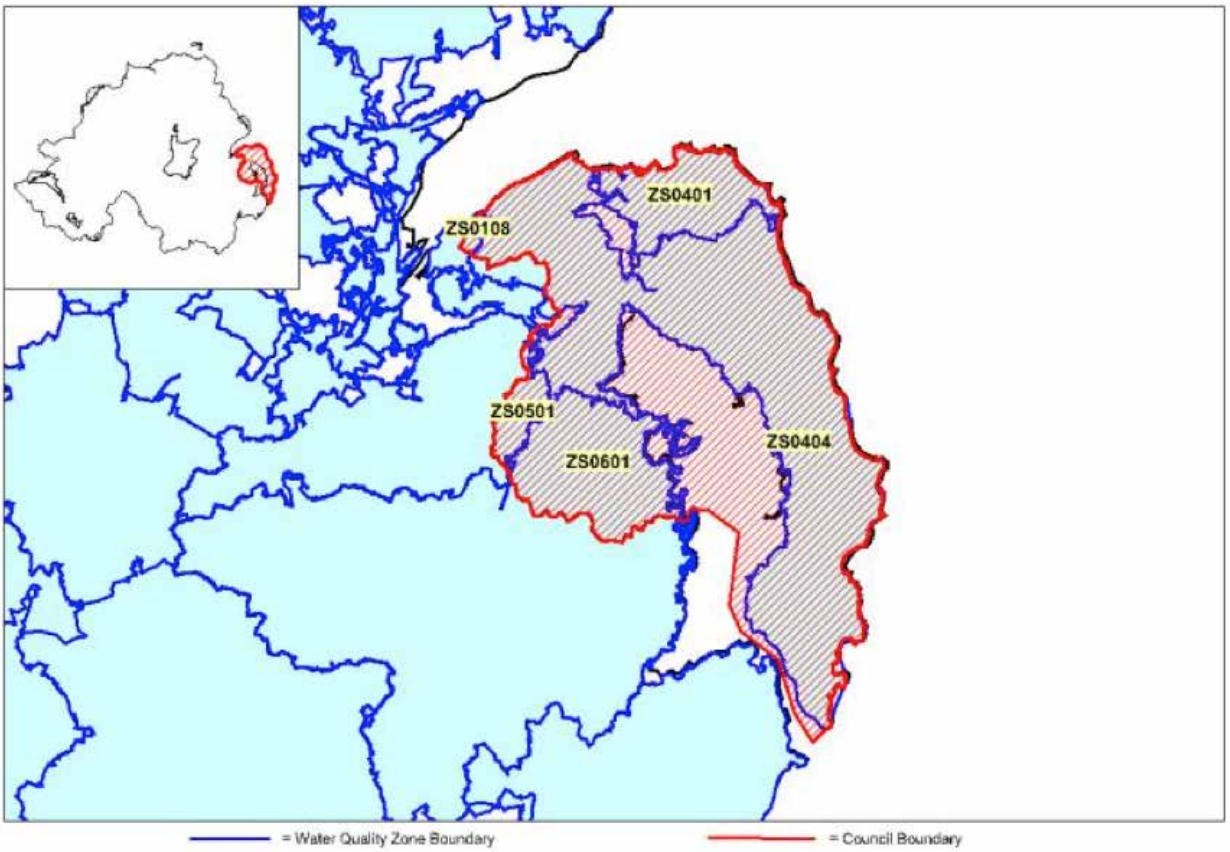
Appendix 3

2016 water quality Capital Works Programmes affecting the council area:

172 North Road, Carrickfergus Storm Sewer Ext.
Antrim South WIIM 2.1 Work Package
Ballyclare Road Glengormley Water mains Upgrade
Dunore West Zone Water main Improvements
Hydraulic Model Rebuilds & Project Management (PC15 Year 2)
Killylane Dunore East Phase 1
NIW Historic Estate Condition Assessments
Non-Infrastructure Major Works
PC15 - PSCEMD (Water)
PC15 Abstraction Monitoring
PC15 Lead Communication Pipe Replacement Programme
PC15 Service Reservoir Sample Taps
PC15 Water mains Rehabilitation WP 10: Belfast North
PC15 Water mains Rehabilitation WP 6: Dungonnell
PPRA's for Rehab Work Packages 2016/17
SEMD Surveys PC10 Water
Service Reservoir Assessments - Site Access
Service Reservoir Security Phase 1
Tardree Zone WM Imps
Water Resource and Supply Resilience Plan
Water Treatment Sites - Water Regulation Compliance & Energy Efficiency Programme
Water Treatment Works Treatability Study
Water mains Rehabilitation, New & Replacement Incorporating First Time Services
WIIM Phase 2 Dunore East WP
WIIM Phase 2 Dunore Point WP
WTW Effluent Quality
WTW Resilience Improvement

Appendix 3

Ards and North Down Borough Council



% Compliance at Customer Tap (including Supply Points)

	Target	2013	2014	2015	2016
Overall Northern Ireland Compliance	99.7%	99.7%	99.8%	99.7%	99.8%
Ards and North Down Compliance	99.7%	99.8%	99.8%	99.8%	99.9%

2016 water supply zones wholly or partially within the council area:

Zone Code	Zone Name	Zone Code	Zone Name
ZS0108	Belfast Purdysburn	ZS0501	Drumaroad Lisburn
ZS0401	Drumaroad Bangor	ZS0601	Drumaroad Ballynahinch
ZS0404	Drumaroad Ards		

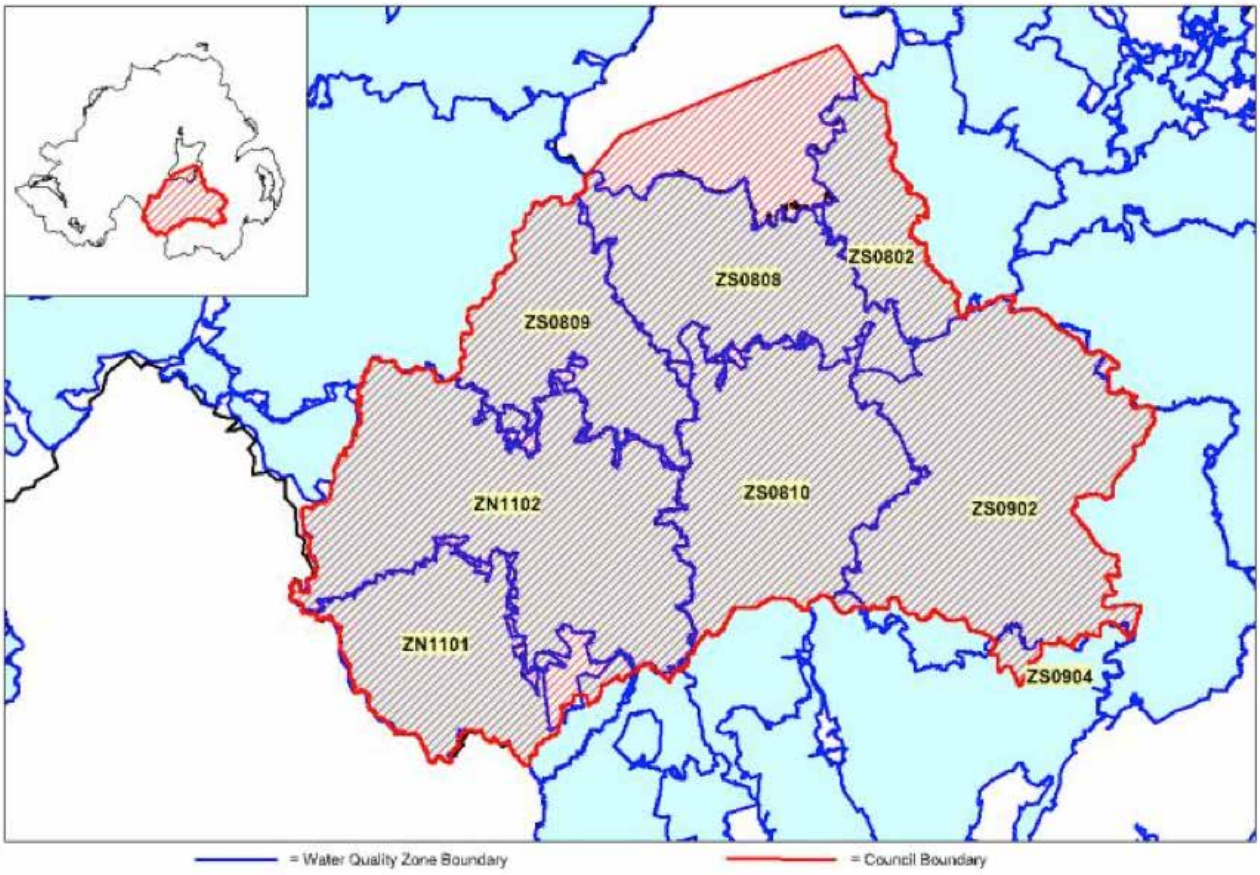
Appendix 3

2016 water quality Capital Works Programmes affecting the council area:

Drumarden Road Portaferry
Hydraulic Model Rebuilds & Project Management (PC15 Year 2)
NIW Historic Estate Condition Assessments
Non-Infrastructure Major Works
PC15 - PSCEMD (Water)
PC15 Abstraction Monitoring
PC15 Lead Communication Pipe Replacement Programme
PC15 Service Reservoir Sample Taps
PPRA's for Rehab Work Packages 2016/17
Replacement Water mains 2014/15 - Reactive, Bundle 2
SEMD Surveys PC10 Water
Service Reservoir Assessments - Site Access
Service Reservoir Security Phase 1
Water Resource and Supply Resilience Plan
Water Treatment Sites - Water Regulation Compliance & Energy Efficiency Programme
Water Treatment Works Treatability Study
Water mains Rehabilitation, New & Replacement Incorporating First Time Services
WTW Effluent Quality
WTW Resilience Improvement

Appendix 3

Armagh City, Banbridge and Craigavon Borough Council



% Compliance at Customer Tap (including Supply Points)

	Target	2013	2014	2015	2016
Overall Northern Ireland Compliance	99.7%	99.7%	99.8%	99.7%	99.8%
Armagh, Banbridge & Craigavon Compliance	99.7%	99.8%	99.8%	99.8%	99.7%

2016 water supply zones wholly or partially within the council area:

Zone Code	Zone Name	Zone Code	Zone Name
ZN1101	Clay Lake Keady	ZS0809	Castor Bay Dungannon
ZN1102	Seagahan Armagh	ZS0810	Castor Bay Tandragee
ZS0802	Castor Bay Lurgan	ZS0902	Fofanny Dromore
ZS0808	Castor Bay Craigavon	ZS0904	Fofanny Mourne

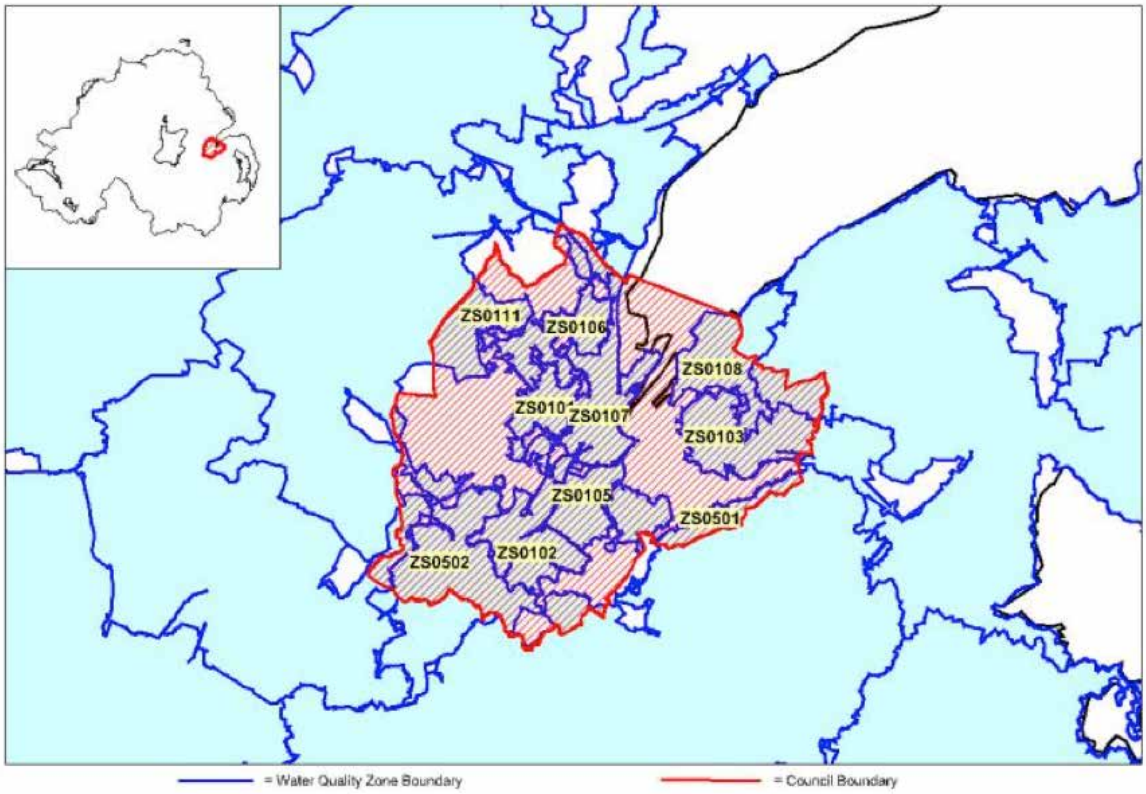
Appendix 3

2016 water quality Capital Works Programmes affecting the council area:

Ballydougan to Newry Main Link Reinforcement
Hydraulic Model Rebuilds & Project Management (PC15 Year 2)
MIMP South (Major Incident Mitigation Project South Region) Freeze Thaw Improvements
NIW Historic Estate Condition Assessments
Non-Infrastructure Major Works
PC15 - PSCEMD (Water)
PC15 Abstraction Monitoring
PC15 Lead Communication Pipe Replacement Programme
PC15 Service Reservoir Sample Taps
PC15 Water mains Rehabilitation WP 1: Fofanny/North Lisburn South
PPRA's for Rehab Work Packages 2016/17
SEMD Surveys PC10 Water
Service Reservoir Assessments - Site Access
Service Reservoir Security Phase 1
Tardree Zone WM Imps
Water Resource and Supply Resilience Plan
Water Treatment Sites - Water Regulation Compliance & Energy Efficiency Programme
Water Treatment Works Treatability Study
Water mains Rehabilitation, New & Replacement Incorporating First Time Services
WIIM Phase 2 Carran Hill Crossmaglen WP
WIIM Phase 2 Clay Lake Keady WP
WP134 High Priority Water Mains Ph1
WTW Effluent Quality
WTW Resilience Improvement

Appendix 3

Belfast City Council



% Compliance at Customer Tap (including Supply Points)

	Target	2013	2014	2015	2016
Overall Northern Ireland Compliance	99.7%	99.7%	99.8%	99.7%	99.8%
Belfast City Council Compliance	99.7%	99.8%	99.8%	99.8%	99.9%

2016 water supply zones wholly or partially within the council area:

Zone Code	Zone Name	Zone Code	Zone Name
ZS0101	Dunore Ballygomartin North	ZS0108	Belfast Purdysburn
ZS0102	Dunore Ballygomartin South	ZS0109	Dorisland Whiteabbey
ZS0103	Belfast Ballyhanwood	ZS0111	Dunore Point Hydepark
ZS0104	Dunore Breda North	ZS0404	Drumaroad Ards
ZS0105	Dunore Breda South	ZS0501	Drumaroad Lisburn
ZS0106	Dunore Belfast North	ZS0502	Forked Bridge Dunmurry
ZS0107	Belfast Oldpark	ZS0503	Forked Bridge Stoneyford

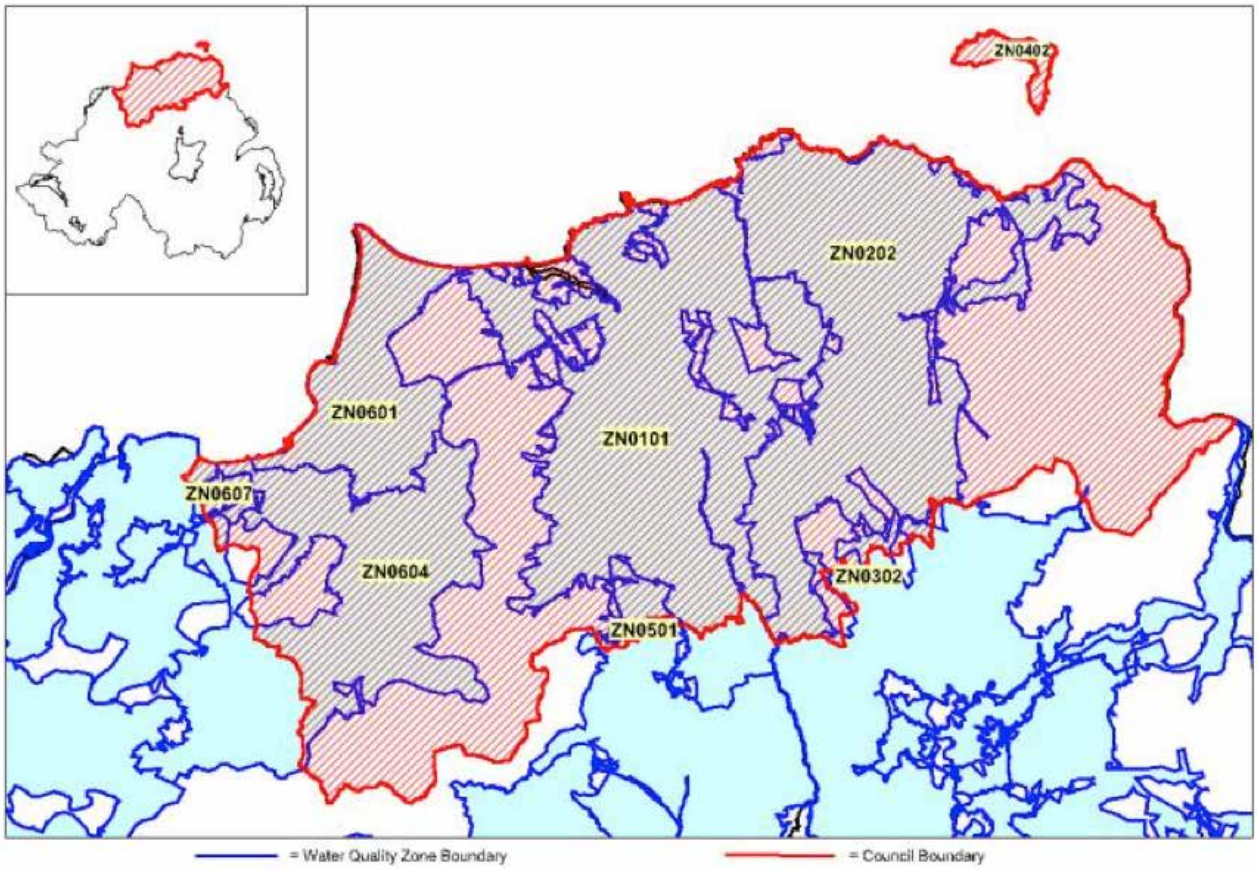
Appendix 3

2016 water quality Capital Works Programmes affecting the council area:

Hydraulic Model Rebuilds & Project Management (PC15 Year 2)
NIW Historic Estate Condition Assessments
Non-Infrastructure Major Works
PC15 - PSCEMD (Water)
PC15 Abstraction Monitoring
PC15 Lead Communication Pipe Replacement Programme
PC15 Service Reservoir Sample Taps
PC15 Water mains Rehabilitation WP 10: Belfast North
PC15 Water mains Rehabilitation WP 2: Forked Bridge Dunmurry
PC15 Water mains Rehabilitation WP 8: Belfast South Ph1
PPRA's for Rehab Work Packages 2016/17
SEMD Surveys PC10 Water
Service Reservoir Assessments - Site Access
Service Reservoir Security Phase 1
Water Resource and Supply Resilience Plan
Water Treatment Sites - Water Regulation Compliance & Energy Efficiency Programme
Water Treatment Works Treatability Study
Water mains Rehabilitation, New & Replacement Incorporating First Time Services
Whiterock Phase 1 Water mains Improvements
WIIM Phase 2 Belfast Ballygomartin North WP
WTW Effluent Quality
WTW Resilience Improvement

Appendix 3

Causeway Coast and Glens Borough Council



% Compliance at Customer Tap (including Supply Points)

	Target	2013	2014	2015	2016
Overall Northern Ireland Compliance	99.7%	99.7%	99.8%	99.7%	99.8%
Causeway Coast and Glens Compliance	99.7%	99.8%	99.8%	99.7%	99.8%

2016 water supply zones wholly or partially within the council area:

Zone Code	Zone Name	Zone Code	Zone Name
ZN0101	Ballinrees Coleraine	ZN0601	Ballinrees Limavady
ZN0202	Altnahinch Bushmills	ZN0603	Carmoney Eglinton
ZN0204	Rathlin Island	ZN0604	Caugh Hill Dungiven
ZN0302	Dungonnell Glarryford	ZN0607	Corrody Derry
ZN0501	Moyola Magherafelt		

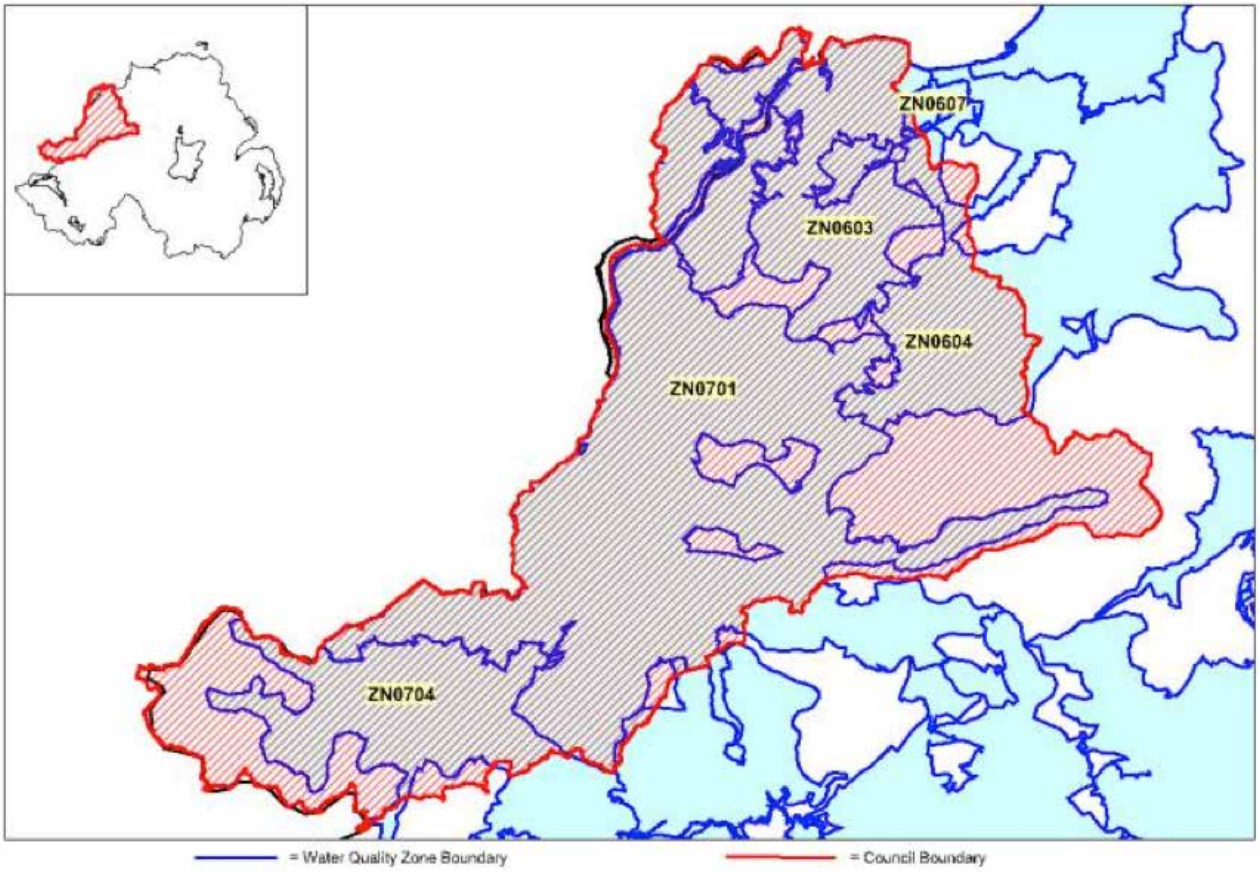
Appendix 3

2016 water quality Capital Works Programmes affecting the council area:

A26 Dualling: Glarryford to A44 (Drones Road) Junction - Water main replacements
Antrim North WIIM 2.1 Work Package
Ballinrees to Limavady/Londonderry Supply Augmentation
Caugh Hill WTW FAS Storage
Glenlough Pumping Station & Pumping Main
Hydraulic Model Rebuilds & Project Management (PC15 Year 2)
Marine Apartments, Ballycastle, W/main ext.
Monaclogh SR Capacity Extension
NIW Historic Estate Condition Assessments
Non-Infrastructure Major Works
PC15 - PSCEMD (Water)
PC15 Abstraction Monitoring
PC15 Lead Communication Pipe Replacement Programme
PC15 Service Reservoir Sample Taps
PPRA's for Rehab Work Packages 2016/17
Replacement Water mains 2014/15 - Reactive, Bundle 1
SEMD Surveys PC10 Water
Service Reservoir Assessments - Site Access
Service Reservoir Security Phase 1
Water Resource and Supply Resilience Plan
Water Treatment Sites - Water Regulation Compliance & Energy Efficiency Programme
Water Treatment Works Treatability Study
Water mains Rehabilitation, New & Replacement Incorporating First Time Services
WIIM Phase 2 Altnahinch Bushmills 2 WP
WIIM Phase 2 Altnahinch Bushmills WP
WIIM Phase 2 Ballinrees Limavady WP
WP134 High Priority Water Mains Ph1
WTW - Treatability Appraisal of Caugh Hill WTW
WTW Effluent Quality
WTW Resilience Improvement
WTWs Five Treatability Appraisal Studies

Appendix 3

Derry City and Strabane District Council



% Compliance at Customer Tap (including Supply Points)

	Target	2013	2014	2015	2016
Overall Northern Ireland Compliance	99.7%	99.7%	99.8%	99.7%	99.8%
Derry City and Strabane Compliance	99.7%	99.9%	99.8%	99.8%	99.6%

2016 water supply zones wholly or partially within the council area:

Zone Code	Zone Name	Zone Code	Zone Name
ZN0603	Carmoney Eglinton	ZN0701	Derg Strabane
ZN0604	Caugh Hill Dungiven	ZN0704	Lough Bradan Drumquin
ZN0607	Corrody Derry		

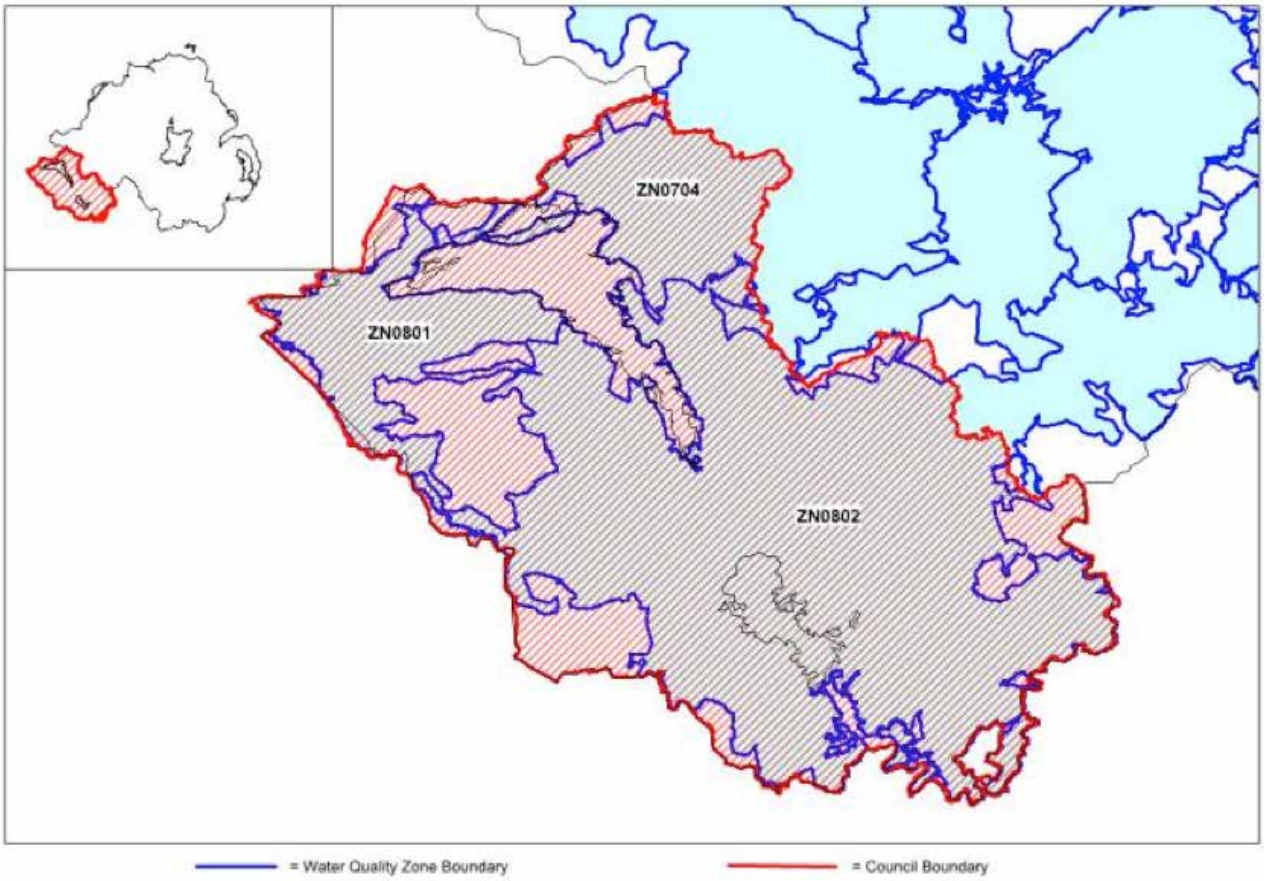
Appendix 3

2016 water quality Capital Works Programmes affecting the council area:

Ballinrees to Limavady/Londonderry Supply Augmentation
Castletown/Koram WPS Upgrade
Caugh Hill, Carmoney to Strabane Strategic Link Water main
Hydraulic Model Rebuilds & Project Management (PC15 Year 2)
NIW Historic Estate Condition Assessments
Non-Infrastructure Major Works
North Tyrone Zone Water main Improvements
PC15 - PSCEMD (Water)
PC15 Abstraction Monitoring
PC15 Lead Communication Pipe Replacement Programme
PC15 Service Reservoir Sample Taps
PPRA's for Rehab Work Packages 2016/17
SEMD Surveys PC10 Water
Service Reservoir Assessments - Site Access
Service Reservoir Security Phase 1
Sustainable Catchment Area Management Project (SCAMP Ireland)
Water Resource and Supply Resilience Plan
Water Treatment Sites - Water Regulation Compliance & Energy Efficiency Programme
Water Treatment Works Treatability Study
Water mains Rehabilitation, New & Replacement Incorporating First Time Services
WP134 High Priority Water Mains Ph1
WTW Effluent Quality
WTW Resilience Improvement
WTWs Five Treatability Appraisal Studies

Appendix 3

Fermanagh and Omagh District Council



% Compliance at Customer Tap (including Supply Points)

	Target	2013	2014	2015	2016
Overall Northern Ireland Compliance	99.7%	99.7%	99.8%	99.7%	99.8%
Fermanagh and Omagh Compliance	99.7%	99.9%	99.8%	99.9%	99.8%

2016 water supply zones wholly or partially within the council area:

Zone Code	Zone Name	Zone Code	Zone Name
ZN0701	Derg Strabane	ZN0706	Lough Macrory Killyclogher
ZN0702	Glenhordial Omagh	ZN0801	Belleek Garrison
ZN0704	Lough Bradan Drumquin	ZN0802	Killyhevlin Enniskillen
ZN0705	Lough Macrory Beragh		

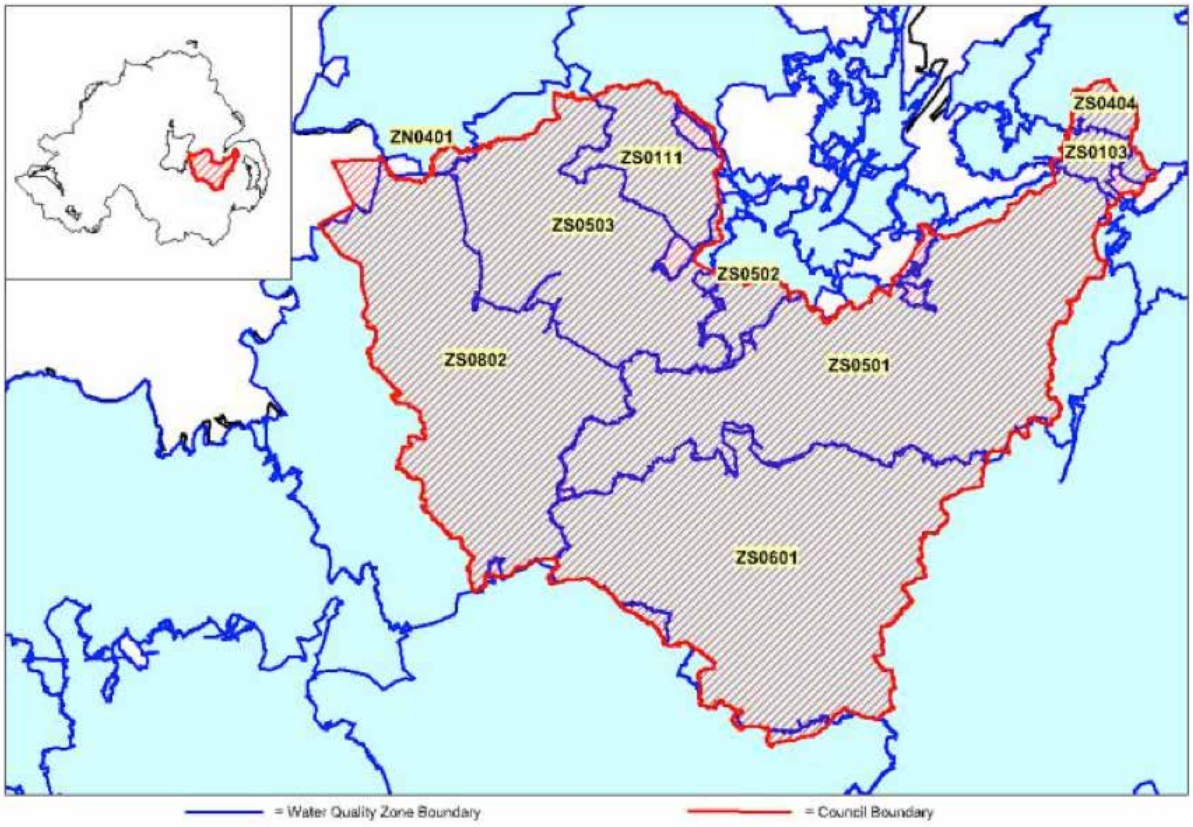
Appendix 3

2016 water quality Capital Works Programmes affecting the council area:

Alleyhill to Doochrock Water main
Belleek Meenacloybane Strategic Main Replacement.
Derg WTW - Upgrade of Filters and Chemical Dosing
Derg WTW MCPA PEO Undertakings
Doochrock to Drumkeeran Water main Upgrades
Glenhordial WTW expansion of existing sludge plant
Hydraulic Model Rebuilds & Project Management (PC15 Year 2)
Killyhevlin Clear Water Tank
Killyhevlin WTW - GAC
Killyhevlin WTW Improvements to sludge settlement system
NIW Historic Estate Condition Assessments
Non-Infrastructure Major Works
North Tyrone Zone Water main Improvements
PC15 - PSCEMD (Water)
PC15 Abstraction Monitoring
PC15 Lead Communication Pipe Replacement Programme
PC15 Service Reservoir Sample Taps
PPRA's for Rehab Work Packages 2016/17
SEMD Surveys PC10 Water
Service Reservoir Assessments - Site Access
Service Reservoir Security Phase 1
South / South East Zonal Study South East Phase 1 Work Packages
Sustainable Catchment Area Management Project (SCAMP Ireland)
Syonfin WPS to Dungoran SR 150mm DI Water main Replacement
Water Resource and Supply Resilience Plan
Water Treatment Sites - Water Regulation Compliance & Energy Efficiency Programme
Water Treatment Works Treatability Study
Water mains Rehabilitation, New & Replacement Incorporating First Time Services
WIIM Phase 2 Lough Braden Drumquin WP
WIIM Phase 2 Lough Macrory WP
WP134 High Priority Water Mains Ph1
WTW Effluent Quality
WTW Resilience Improvement
WTWs Five Treatability Appraisal Studies

Appendix 3

Lisburn and Castlereagh City Council



% Compliance at Customer Tap (including Supply Points)

	Target	2013	2014	2015	2016
Overall Northern Ireland Compliance	99.7%	99.7%	99.8%	99.7%	99.8%
Lisburn and Castlereagh Compliance	99.7%	99.9%	99.9%	99.8%	99.9%

2016 water supply zones wholly or partially within the council area:

Zone Code	Zone Name	Zone Code	Zone Name
ZN0401	Dunore Point Antrim	ZS0502	Forked Bridge Dunmurry
ZS0103	Belfast Ballyhanwood	ZS0503	Forked Bridge Stoneyford
ZS0108	Belfast Purdysburn	ZS0601	Drumaroad Ballynahinch
ZS0111	Dunore Point Hydepark	ZS0802	Castor Bay Lurgan
ZS0404	Drumaroad Ards	ZS0902	Fofanny Dromore
ZS0501	Drumaroad Lisburn		

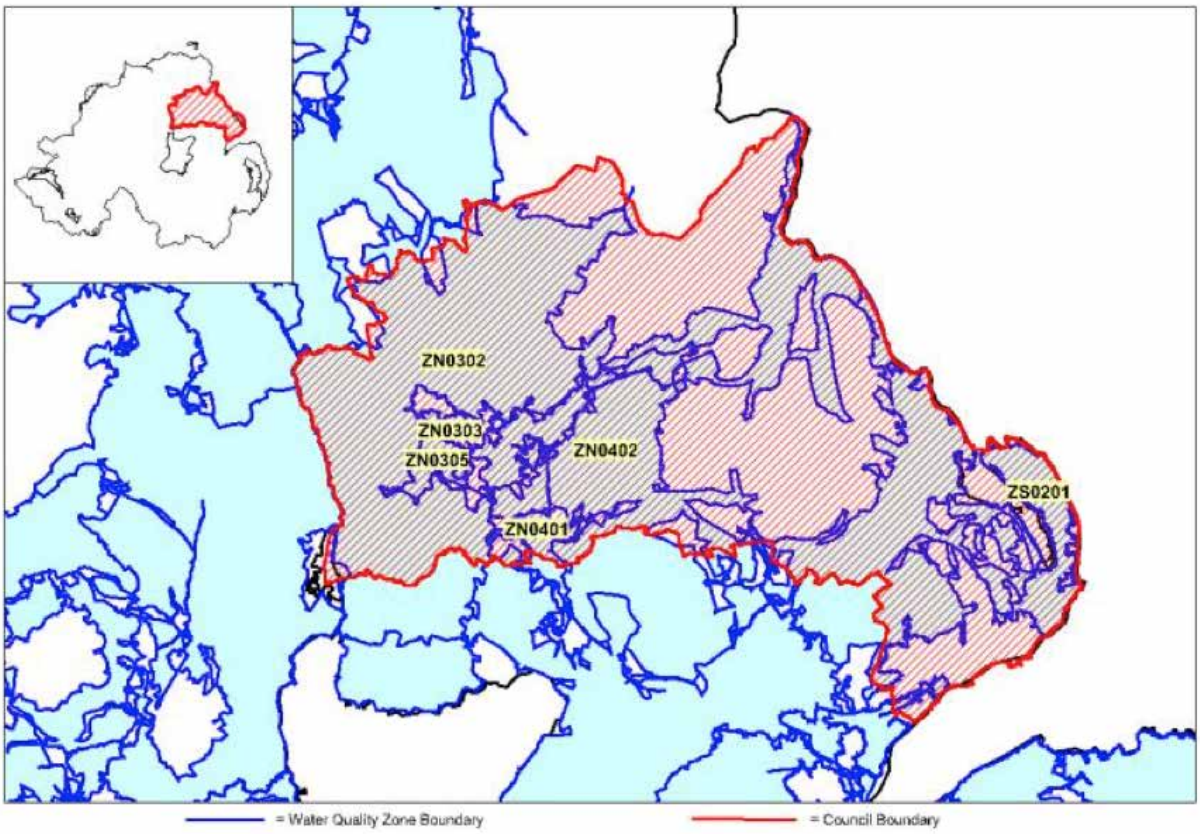
Appendix 3

2016 water quality Capital Works Programmes affecting the council area:

Hydraulic Model Rebuilds & Project Management (PC15 Year 2)
Lisburn South Rural Phase 1 & Dunmurry watermain improvements
MIMP South (Major Incident Mitigation Project South Region) Freeze Thaw Improvements
NIW Historic Estate Condition Assessments
Non-Infrastructure Major Works
PC15 - PSCEMD (Water)
PC15 Abstraction Monitoring
PC15 Lead Communication Pipe Replacement Programme
PC15 Service Reservoir Sample Taps
PC15 Watermains Rehabilitation WP 1: Fofanny/North Lisburn South
PC15 Watermains Rehabilitation WP 2: Forked Bridge Dunmurry
PPRA's for Rehab Work Packages 2016/17
SEMD Surveys PC10 Water
Service Reservoir Assessments - Site Access
Service Reservoir Security Phase 1
Water Resource and Supply Resilience Plan
Water Treatment Sites - Water Regulation Compliance & Energy Efficiency Programme
Water Treatment Works Treatability Study
Watermains Rehabilitation, New & Replacement Incorporating First Time Services
WTW Effluent Quality
WTW Resilience Improvement

Appendix 3

Mid and East Antrim Borough Council



% Compliance at Customer Tap (including Supply Points)

	Target	2013	2014	2015	2016
Overall Northern Ireland Compliance	99.7%	99.7%	99.8%	99.7%	99.8%
Mid and East Antrim Compliance	99.7%	99.8%	99.8%	99.8%	99.8%

2016 water supply zones wholly or partially within the council area:

Zone Code	Zone Name	Zone Code	Zone Name
ZN0302	Dungonnell Glarryford	ZN0402	Killylane Ballynure
ZN0303	Dunore Point Ballymena	ZS0109	Dorisland Whiteabbey
ZN0305	Dungonnell Ahoghill	ZS0201	Dorisland Carrick
ZN0401	Dunore Point Antrim		

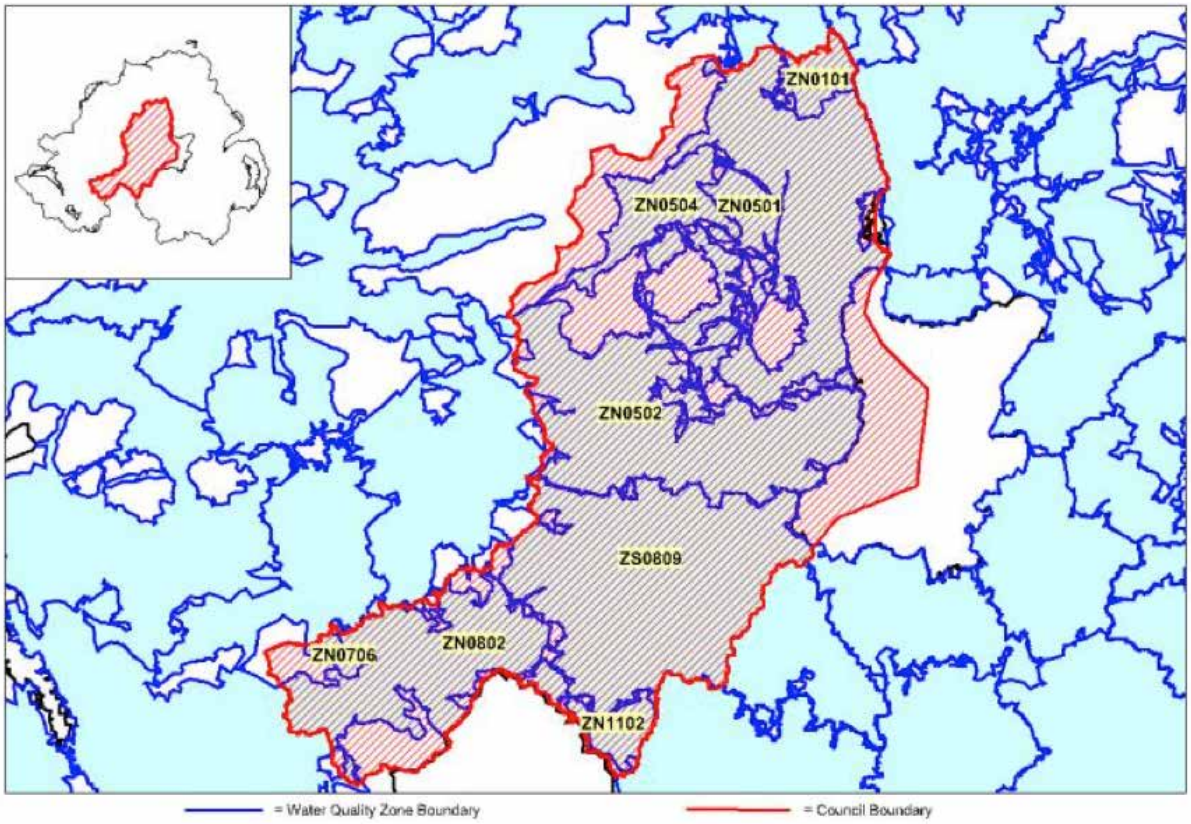
Appendix 3

2016 water quality Capital Works Programmes affecting the council area:

A26 Dualling: Glarryford to A44 (Drones Road) Junction - Water main replacements
Antrim North WIIM 2.1 Work Package
Antrim South WIIM 2.1 Work Package
Carrickfergus Road, Larne, Water Quality Schemes.
Carrickfergus Zone Water main Improvements Phase 1
Dorisland Impounding Reservoir
Hydraulic Model Rebuilds & Project Management (PC15 Year 2)
Killylane Dunore East Phase 1
NIW Historic Estate Condition Assessments
Non-Infrastructure Major Works
PC15 - PSCEMD (Water)
PC15 Abstraction Monitoring
PC15 Lead Communication Pipe Replacement Programme
PC15 Service Reservoir Sample Taps
PC15 Water mains Rehabilitation WP 3: Killylane
PC15 Water mains Rehabilitation WP 4: Ballymena Ph1
PC15 Water mains Rehabilitation WP 6: Dungonnell
PC15 Water mains Rehabilitation WP 7: Carrickfergus
PPRA's for Rehab Work Packages 2016/17
Replacement Water mains 2014/15 - Reactive, Bundle 1
Replacement Water mains 2014/15 - Reactive, Bundle 2
SEMD Surveys PC10 Water
Service Reservoir Assessments - Site Access
Service Reservoir Security Phase 1
Tardree Zone WM Imps
Tully Rehab Work Packages.
Water Resource and Supply Resilience Plan
Water Treatment Sites - Water Regulation Compliance & Energy Efficiency Programme
Water Treatment Works Treatability Study
Water mains Rehabilitation, New & Replacement Incorporating First Time Services
WTW Effluent Quality
WTW Resilience Improvement
WTWs Five Treatability Appraisal Studies

Appendix 3

Mid-Ulster District Council



% Compliance at Customer Tap (including Supply Points)

	Target	2013	2014	2015	2016
Overall Northern Ireland Compliance	99.7%	99.7%	99.8%	99.7%	99.8%
Mid-Ulster Compliance	99.7%	99.9%	99.7%	99.8%	99.8%

2016 water supply zones wholly or partially within the council area:

Zone Code	Zone Name	Zone Code	Zone Name
ZN0101	Ballinrees Coleraine	ZN0706	Lough Macrory Killyclogher
ZN0501	Moyola Magherafelt	ZN0802	Killyhevlin Enniskillen
ZN0502	Lough Fea Cookstown	ZN1102	Seagahan Armagh
ZN0504	Moyola Unagh Mormeal	ZS0809	Castor Bay Dungannon
ZN0705	Lough Macrory Beragh		

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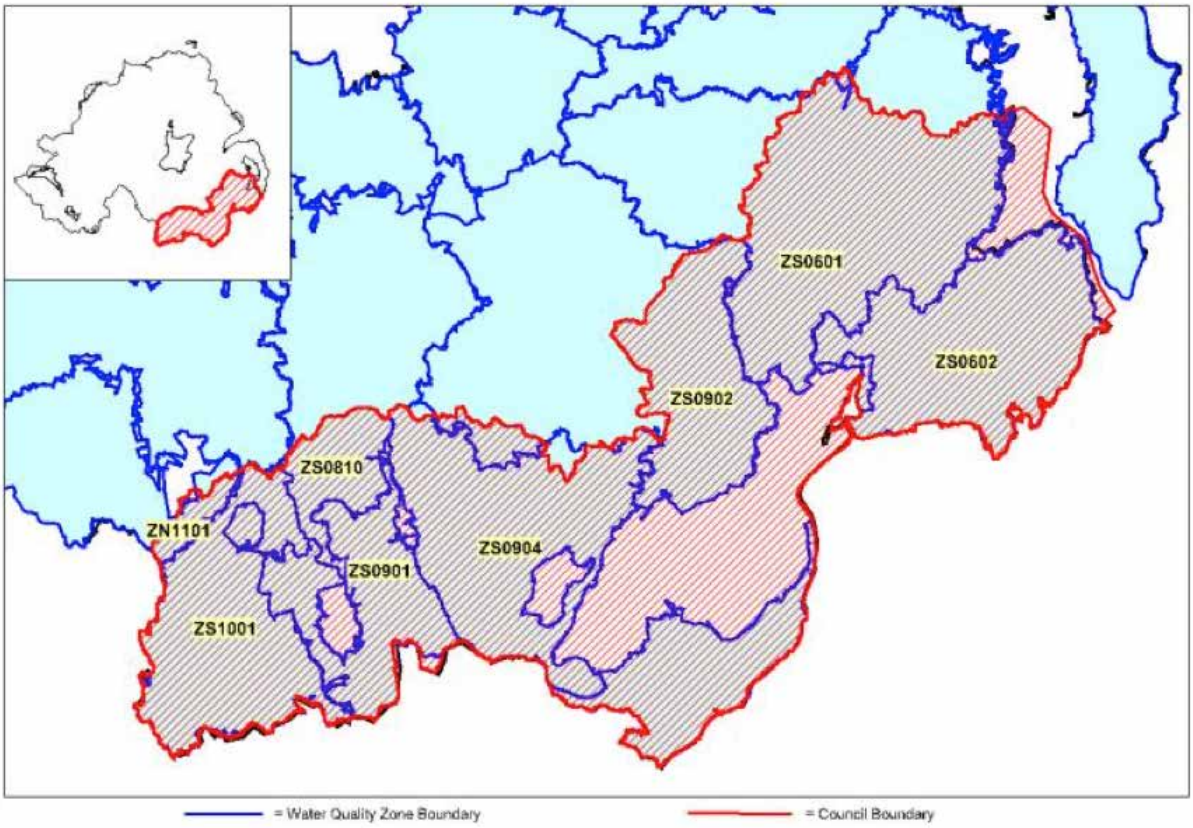
2016 water quality Capital Works Programmes affecting the council area:

A31 Magherafelt By-Pass, Water main Diversions
A6 Castledawson to Randalstown
Antrim North WIIM 2.1 Work Package
Carland to Cookstown Strategic Trunk Main
Cookstown Phase 2 Water main Improvements
Granville Dungannon Invest NI Water main Extension
Hydraulic Model Rebuilds & Project Management (PC15 Year 2)
Lough Fea CWB Capacity Increase
MIMP South (Major Incident Mitigation Project South Region) Freeze Thaw Improvements
NIW Historic Estate Condition Assessments
Non-Infrastructure Major Works
PC15 - PSCEMD (Water)
PC15 Abstraction Monitoring
PC15 Lead Communication Pipe Replacement Programme
PC15 Service Reservoir Sample Taps
PC15 Water mains Rehabilitation WP 8: Belfast South Ph1
PPRA's for Rehab Work Packages 2016/17
Replacement Water mains 2014/15 - Reactive, Bundle 2
SEMD Surveys PC10 Water
Service Reservoir Assessments - Site Access
Service Reservoir Security Phase 1
Water Resource and Supply Resilience Plan
Water Treatment Sites - Water Regulation Compliance & Energy Efficiency Programme
Water Treatment Works Treatability Study
Water mains Rehabilitation, New & Replacement Incorporating First Time Services
WIIM Phase 2 Lough Fea WP
WIIM Phase 2 Moyola Magherafelt WP
WTW Effluent Quality
WTW Resilience Improvement

Appendix 3

Newry, Mourne and Down District Council



% Compliance at Customer Tap (including Supply Points)

	Target	2013	2014	2015	2016
Overall Northern Ireland Compliance	99.7%	99.7%	99.8%	99.7%	99.8%
Newry, Mourne and Down Compliance	99.7%	99.8%	99.8%	99.7%	99.8%

2016 water supply zones wholly or partially within the council area:

Zone Code	Zone Name	Zone Code	Zone Name
ZN1101	Clay Lake Keady	ZS0901	Camlough Newry West
ZS0601	Drumaroad Ballynahinch	ZS0902	Fofanny Dromore
ZS0602	Drumaroad Downpatrick	ZS0904	Fofanny Mourne
ZS0810	Castor Bay Tandragee	ZS1001	Carran Hill Crossmaglen

Appendix 3

2016 water quality Capital Works Programmes affecting the council area:

Ballydougan to Newry Main Link Reinforcement
Drumaroad WTW Clear Water Tank
Hydraulic Model Rebuilds & Project Management (PC15 Year 2)
MIMP South (Major Incident Mitigation Project South Region) Freeze Thaw Improvements
NIW Historic Estate Condition Assessments
Non-Infrastructure Major Works
PC15 - PSCEMD (Water)
PC15 Abstraction Monitoring
PC15 Lead Communication Pipe Replacement Programme
PC15 Service Reservoir Sample Taps
PC15 Water mains Rehabilitation WP 1: Fofanny/North Lisburn South
PPRA's for Rehab Work Packages 2016/17
SEMD Surveys PC10 Water
Service Reservoir Assessments - Site Access
Service Reservoir Security Phase 1
Sustainable Catchment Area Management Project (SCAMP Ireland)
Water Resource and Supply Resilience Plan
Water Treatment Sites - Water Regulation Compliance & Energy Efficiency Programme
Water Treatment Works Treatability Study
Water mains Rehabilitation, New & Replacement Incorporating First Time Services
WIIM Phase 2 Carran Hill Crossmaglen WP
WP101 Newry Phase2
WP134 High Priority Water Mains Ph1
WTW Effluent Quality
WTW Resilience Improvement

Appendix 4

Water Quality Events

Significant Drinking Water Quality Events in 2016

Date of Significant Event	Area and Estimate of Population/ Properties Potentially Affected	Nature and Cause of Significant Event	Associated Council Area(s)
17/01/16 – 18/01/16	Donegore SR (2,000 properties)	Water quality was impacted following a burst water main.	Antrim & Newtownabbey
22/01/16 - 23/01/16	Drumaroad WTWs (515,000 population)	An aluminium contravention was reported in the Drumaroad WTWs supply area when base maintenance was being undertaken at the works. No cause was determined.	Ards & North Down, Belfast, Lisburn & Castlereagh and Newry, Mourne & Down
27/01/16	Drumaroad WTWs (515,000 population)	Elevated aluminium levels were observed in the works final water due to treatment difficulties.	Ards & North Down, Belfast, Lisburn & Castlereagh and Newry, Mourne & Down
02/02/16	Drumaroad WTWs (515,000 population)	An aluminium contravention was reported in the Drumaroad WTWs final water. No cause was determined but base maintenance was ongoing at this time.	Ards & North Down, Belfast, Lisburn & Castlereagh and Newry, Mourne & Down
10/02/16	Killylane WTWs (51,000 population)	An aluminium contravention occurred in a sample taken at a consumer tap to represent the works final water. No cause was determined.	Antrim & Newtownabbey and Mid & East Antrim
19/02/16 Ongoing	Glenhugh Road, Ahoghill	Persistent contraventions of the iron parameter were reported after a local political representative raised residents' concerns over water quality in the area.	Mid & East Antrim
22/02/16	Carran Hill WTWs (14,000 population)	A contravention of the individual pesticide standard for Clopyralid occurred in the works final water. No cause was determined.	Newry, Mourne & Down
07/03/16	Castor Bay WTWs (362,000 population)	A contravention of the individual pesticide standard for Clopyralid occurred in the works final water. No cause was determined.	Armagh City, Banbridge & Craigavon; Belfast City; Lisburn & Castlereagh; Mid Ulster; and Newry, Mourne & Down
09/04/16 - 10/04/16	Castor Bay WTWs (362,000 population)	Contraventions of the Clostridium perfringens and aluminium parameters were related to treatment difficulties which occurred following a works shutdown.	Armagh City, Banbridge & Craigavon; Belfast City; Lisburn & Castlereagh; Mid Ulster; and Newry, Mourne & Down
25/04/16 - 26/04/16	Dorisland WTWs (128,000 population)	Works shutdowns and the resultant treatment difficulties led to contraventions of the aluminium and turbidity parameters in the works final water.	Antrim & Newtownabbey, Belfast City; and Mid & East Antrim
25/05/16 – 07/09/16	Derg WTWs (38,000 population)	Lack of adequate pesticide removal treatment led to persistent MCPA contraventions in the works final water.	Derry City & Strabane and Fermanagh & Omagh

Appendix 4

Date of Significant Event	Area and Estimate of Population/ Properties Potentially Affected	Nature and Cause of Significant Event	Associated Council Area(s)
01/06/16 - 10/06/16	Rathlin Island (300 population)	A contravention of the taste parameter was reported for a sample taken on Rathlin Island. There was potential for seawater contamination at this location.	Causeway Coast & Glens
16/06/16 - 27/06/16	Sunningdale Drive, Belfast (30 properties)	Accidental contamination of the mains during rehabilitation work led to contraventions of the odour parameter.	Belfast City
18/07/16 - 07/10/16	Derg WTWs (38,000 population)	Lack of adequate treatment led to persistent THM contraventions in the works final water.	Derry City & Strabane and Fermanagh & Omagh
18/07/16 - 30/08/16	Dungonnell WTWs (31,000 population)	Treatment difficulties led to persistent THM contraventions in the area supplied by Dungonnell WTWs.	Causeway Coast & Glens and Mid & East Antrim
01/08/16 - 03/08/16	Carmoney WTWs (50,000 population)	The upper catchment of the River Faughan was polluted with silage. Carmoney WTWs was shut down for almost 2 days as a precaution.	Derry City & Strabane
25/08/16 - 31/08/16	Rathlin WTWs (300 population)	A contravention of the WHO Index for THMs occurred in the works final water. This event followed an increase in the chlorine dose made in response to a low level of chlorine detected.	Causeway Coast & Glens
26/08/16 - 30/08/16	Silverstream Avenue, Belfast (11 properties)	Coliform bacteria were detected in a small localised area of Silverstream Avenue for four days. No cause was determined.	Belfast City
30/08/16 - 03/10/16	Caugh Hill WTWs (72,000 population)	Treatment difficulties led to persistent THM contraventions in Caugh Hill WTWs final water and in the related distribution system.	Causeway Coast & Glens and Derry City & Strabane
30/08/16	Killylane WTWs (51,000 population)	There was a marginal THM contravention in the Killylane supply area due to a combination of factors. All re-samples were satisfactory.	Antrim & Newtownabbey and Mid & East Antrim
10/09/16 – 22/09/16	Loughabin Road, Ballymoney (3 properties)	Following the detection of significantly elevated iron and turbidity levels, a “Do Not Use” notice was issued to 3 properties.	Causeway Coast & Glens
11/09/16	Derg WTWs (38,000 population)	A contravention of the turbidity standard occurred in the works final water. This occurred after a works shutdown.	Derry City & Strabane and Fermanagh & Omagh
15/09/16 – 23/11/16	Stewarts Road, Annalong (5 properties)	Persistent contraventions of the aluminium and hydrogen ion (pH) parameters occurred. Remedial work was carried out and all re-samples were satisfactory.	Newry, Mourne & Down
19/09/16 – 22/09/16	Glenhordial WTWs (11,000 population)	A contravention of the iron standard occurred in the works final water. No cause was determined.	Fermanagh & Omagh, Mid Ulster
30/11/16 – 05/12/16	Altnahinch WTWs (31,000 population)	Treatment difficulties led to a contravention of the aluminium standard in the works final water.	Causeway Coast & Glens

Appendix 4

Date of Significant Event	Area and Estimate of Population/ Properties Potentially Affected	Nature and Cause of Significant Event	Associated Council Area(s)
07/12/16 -08/12/16	Castor Bay WTWs (362,000 population)	A contravention of the turbidity standard occurred in Forked Bridge WTWs final water following treatment difficulties at Castor Bay WTWs following a works shutdown.	Armagh City, Banbridge & Craigavon; Belfast City; Lisburn & Castlereagh; Mid Ulster; and Newry, Mourne & Down
21/12/16 – 22/12/16	Belfast City Centre	A number of burst mains in Belfast City Centre caused sufficiency and water quality issues. There was local media interest.	Belfast City

Minor Drinking Water Quality Events in 2016

Date of Minor Event	Area and Estimate of Population/ Properties Potentially Affected	Nature and Cause of Minor Event	Associated Council Area(s)
29/01/16 – 09/02/16	Dungonnell WTWs (31,000 population)	Loss of automatic disinfection due to component failure. However disinfection was manually maintained.	Causeway Coast & Glens and Mid & East Antrim
16/02/16 – 17/02/16	Fofanny WTWs (103,000 population)	No cause was determined for a Clostridium perfringens contravention. All resamples were satisfactory.	Newry, Mourne & Down
03/03/16 – 22/04/16	Dorisland WTWs (128,000 population)	Loss of automatic disinfection due to component failure. However disinfection was manually maintained.	Antrim & Newtownabbey; Belfast City and Mid & East Antrim
04/03/16 – 09/03/16	Cohannon Inn, Coalisland (One property)	A “Boil Water Before Use” Notice was issued to this property after a recurring coliform bacteria contravention.	Mid-Ulster
20/03/16 – 23/03/16	Dungonnell WTWs (31,000 population)	Loss of automatic disinfection due to issue with salt used in process. However disinfection was manually maintained.	Causeway Coast & Glens and Mid & East Antrim
01/05/16 – 03/05/16	Rathlin WTWs (300 population)	Loss of automatic disinfection due to component failure. However disinfection was manually maintained.	Causeway Coast & Glens
19/07/16 – 23/07/16	Shankill Road, Belfast (10 properties)	Coliform bacteria contraventions occurred following mains replacement in the area. It is likely there was contamination of the pre-chlorinated main during this process.	Belfast City
20/09/16 – 23/03/16	Altnahinch WTWs (31,000 population)	Loss of automatic disinfection due to component failure. However disinfection was manually maintained.	Causeway Coast & Glens and Mid & East Antrim
20/11/16 – 21/11/16	Dorisland WTWs (128,000 population)	No cause was determined for a coliform bacteria contravention in the works final water. All re-samples were satisfactory.	Antrim & Newtownabbey; Belfast City; and Mid & East Antrim

Appendix 4

Not Significant Drinking Water Quality Events in 2016

Date of Not Significant Event	Area and Estimate of Population/ Properties Potentially Affected	Nature and Cause of Not Significant Event	Associated Council Area(s)
02/02/16 – 03/02/16	Lough Macrory WTWs (34,000 population)	No cause was determined for an aluminium contravention in the works final water. All re-samples were satisfactory.	Fermanagh & Omagh
18/02/16 – 19/02/16	Lough Fea WTWs (43,000 population)	Aluminium, iron and turbidity contraventions occurred due to unrepresentative sampling. All re-samples were satisfactory.	Mid-Ulster
02/03/16 – 03/03/16	Killyhevlin WTWs (76,000 population)	A turbidity contravention occurred due to unrepresentative sampling. All re-samples were satisfactory.	Fermanagh & Omagh and Mid Ulster
02/03/16 – 03/03/16	Caugh Hill WTWs (72,000 population)	A turbidity contravention occurred due to unrepresentative sampling. All re-samples were satisfactory.	Causeway Coast & Glens and Derry City & Strabane
04/04/16 – 05/04/16	Clay Lake WTWs (9,000 population)	No cause was determined for a Clostridium perfringens contravention. All re-samples were satisfactory.	Armagh City, Banbridge & Craigavon and Newry, Mourne & Down
22/05/16	Seagahan WTWs (35,000 population)	Minor pollution of the impounding reservoir remote from the intake may have been caused by slurry spreading. The final water was not impacted.	Armagh City, Banbridge & Craigavon
05/07/16 – 07/05/16	Carmoney WTWs (50,000 population)	An odour contravention occurred due to unrepresentative sampling. All re-samples were satisfactory.	Derry City & Strabane
11/07/16 – 14/07/16	Glenhordial WTWs (92,000 population)	A turbidity contravention occurred due to unrepresentative sampling. All re-samples were satisfactory.	Fermanagh & Omagh, Mid Ulster
25/07/16 – 02/08/16	Mullaghanagh SR (7,000 population)	Recurring coliform bacteria contraventions occurred due to unrepresentative sampling. Further re-samples were satisfactory.	Mid-Ulster
03/08/16	Mullaghanagh SR (1,662 properties)	Alternative water supplies were provided after loss of supply following operational work.	Mid-Ulster
29/09/16 – 30/09/16	Rehaghy SR (253 properties)	Tankering into the service reservoir was required after a burst main.	Mid-Ulster
11/11/16 – 12/11/16	Killylane WTWs (51,000 population)	Contamination at the time of sampling led to a coliform bacteria contravention in the works final water. All re-samples were satisfactory.	Antrim & Newtownabbey and Mid & East Antrim
30/11/16 – 03/12/16	Glen Road, Belfast (414 properties)	Coliform bacteria contraventions occurred following the repair of a burst main. No cause was determined.	Belfast City
05/12/16 – 06/12/16	Killylane WTWs (51,000 population)	No cause was determined for a Clostridium perfringens contravention. All re-samples were satisfactory.	Antrim & Newtownabbey and Mid & East Antrim

Appendix 5

Water Supply (Water Fittings) Regulations (NI) 2009 Compliance Policy

NI Water's customer leaflet "Water Fittings Regulations" details why the Water Supply (Water Fittings) Regulations exist and highlights to customers their obligations under the Regulations. A web page has been set up on the NI Water web site for customers where they can download the regulations, guidance notes, information leaflets and notification forms. Both the leaflets and web pages provide customers with a valuable insight to and appreciation of what the Regulations mean to them, the benefits in protecting drinking water supplies and the potential consequences of non-compliance. Customers are advised both online and in leaflets that before they commence certain plumbing installations or alterations they must first notify NI Water in writing. 10 days advance notice is required before work can commence. If customers do not hear from NI Water within 10 working days of writing to us then consent is 'deemed' to have been given and the work can proceed. NI Water promotes and advocates the benefits of customers using Approved Contractors (ACs) who are members of WaterSafe and the Plumbing Industry Licensing Scheme (PILS). The PILS scheme is administered by the trade association known as the Scottish and Northern Ireland Plumbing Employers Federations (SNIPEF).

NI Water has a team of five customer facing water regulation inspectors across the province; an operational Field Manager and all activities as overseen by a Senior Engineer directly managing the team.

NI Water has allocated each non-domestic customer a fluid category rating which was derived from Standard Industrial Classification (SIC) codes and guidance provided by the Water Regulation Advisory Scheme (WRAS). A proactive inspection programme is carried out each year with inspection intervals based on national 'Best Practice' documentation issued to the water authorities by WRAS and accepted by the Department for Environment, Food and Rural Affairs (DEFRA).

The Water Fittings Regulation team has systems and processes in place, which are used to schedule and report on inspections, repeat inspections, their findings, contraventions and improvement notices. The Regulation team regularly liaises with external customers, scientific services and networks water teams within the company regarding compliance and non-compliance with the regulations. The team also liaises with other GB water company regulation teams and water industry expert groups to ensure a consistent application of the Regulations.

NI Water will only consider applying to the Regulator (WDPD) within DfI, for a relaxation of requirements in exceptional circumstances and not as a result of failure or lack of due diligence by customers to comply with their legal obligations under the Regulations.

NI Water Customer Base

Base Data, using NIAUR 2017 Annual Information Return (AIR) figures:

Description	Number
**Total number of connected properties	833,886
*Total number of new connections from 1st Jan 2016 – 31st Dec 2016	
Up to and including 32mm dia.	8,127
Over 32mm dia.	62

**Financial Year, * Calendar Year

Compliance Data

Staff and Training

Number of staff involved in enforcement.

Description	Number
Spending more than 75% of time	6
Spending between 50% and 75% of time	1
Spending between 0% and 5% of time	0

All Water Fittings Regulation team members including line management will have attended one or more of the courses detailed below and attained qualifications as certified by the training organisations or award body. As a minimum, all Regulation Compliance staff are expected to have passed the City and Guilds qualification in Water Fittings Regulations for Compliance staff. Any change of staff will be conditional on new team members undertaking and passing the Water Regulation C&G qualification.

- C&G Water Supply (Water Fittings) Regulations for Compliance Staff
- Introduction into RPZ installations (Reduced Pressure Zone Devices)

Appendix 5

Promotion of the Regulations

As a fully subscribing member of WRAS, NI Water has representation on the WRAS Board, Technical Committee and Technical Support Group national forums, which each meet 4 times per year.

NI Water uses WRAS for advice on the interpretation of the Regulations where unusual installations are discovered or where a dispute with an installer/ manufacturer occurs regarding the particular meaning of a certain regulation. Participation on this national stage ensures that NI Water like other water suppliers is applying the Regulations consistently across its customer base. It also provides a very useful networking forum where NI Water and other water suppliers can field difficult and complex questions and receive comprehensive and timely feedback.

A Water Regulation web page is available on the company web site (**http://www.niwater.com/water-fittings-regulations/**) for both domestic and non-domestic customers to refer to. The site contains Regulation specific background information, leaflets in PDF format and customer notification forms. An official Water Regulation e-mail address has also been provided to facilitate customer enquiries.

Notifications

Description	Number
*Total No. of water connection application forms received between 01/Jan/2016 and 31/Dec/2016	2552
<32mm >32mm	2490 62
*Total No. of new connections made between 01/Jan/2016 and 31/Dec/2016	5827
**Total number of written customer notifications other than those associated with new connections applications RPZs etc.	24

*Calendar year

** Financial year

In most cases, customers must notify NI Water in advance of installing or making changes to the water plumbing systems within their premises. Owners, occupiers and plumbing installers must obtain approval from NI Water by giving advance notice in writing of their intentions. Advance notification forms can be obtained from the NI Water website, completed and returned to the address detailed on the form. The list of work that cannot commence without advance notification can be obtained by referring to the Water Fittings Regulations and is detailed under Regulation 5. NI Water will not unreasonably withhold consent for any work but it may be granted subject to conditions, which must be followed. If customers do not hear from NI Water within 10 working days of writing to us, consent is deemed to have been given and work may proceed.

N I Water recommends that customers use an approved plumbing contractor when installing, altering or repairing plumbing systems, water fittings and water-using appliances.

Approved Contractors Scheme

Owners and occupiers of premises and anyone who installs plumbing systems have a legal duty to ensure their systems satisfy the requirements of the Water Supply (Water Fittings) Regulations (Northern Ireland) 2009.

NI Water recommends customers use approved plumbing contractors who are members of an approved contractors' scheme. These include firms and individuals who are members of the WaterSafe scheme funded by the water industry including NI Water. WaterSafe is a dedicated search facility bringing together thousands of qualified contractors employed by plumbing businesses from the existing Approved Contractors scheme across the UK. WaterSafe can be contacted by telephoning 0333 2079030 or by referring to **www.watersafe.org.uk**. The Scottish and Northern Ireland Plumbing Employers Federation (SNIPEF) Plumbing Industry Licensing Scheme is also a long-standing approved contractor scheme which NI Water also recommends.

To find a SNIPEF Licensed Plumber in your area simply enter your postcode or town on their web site **www.needaplumber.org.uk** or contact SNIPEF on 0131 556 0600.

An approved plumbing contractor will certify that his or her work meets the requirements of the Regulations, and any subsequent breaches associated with their work is the legal responsibility of the plumber and not the individual owner or occupier.

Description (Number)	2011	2012	2013	2014	2015	2016
No of members in Northern Ireland.	72	65	27	27	58	54
No of members in Northern Ireland who are members of the **Plumbing Industry Licensing Scheme** (PILS)	72	65	27	27	58	54
No. of Northern Ireland members who are members of the **Plumbing Industry Licensing Scheme** and who are with **WaterSafe**	-	-	35	36	38	50
No of members in Northern Ireland awaiting approval as approved members of the Plumbing Industry Licensing Scheme or who are working to meet the criteria to be Approved Contractors	10	9	9	9	14	15

Appendix 5

Inspections (Other than those arising from Notification)

Description	Number 2014	Number 2015	Number 2016
*Total number of Domestic and Non Domestic Inspections	1320	1185	947
*Total number of active Contraventions recorded in year	1775	814	1066
*Total number of closed Contraventions in year	725	163	786
*Total Number of outstanding contraventions in year	1053	651	280

*Calendar year

Contraventions found on all property types can vary greatly, some typical examples are listed below

- Failure to comply with Regulation 5 – Notifications.
- Water fittings non-compliant with Regulation 4.
- Storage cisterns having the wrong type of Air Gap fitted.
- Overflows running to waste in non-visual areas.
- Dead legs on pipe-work.
- The requirement to install servicing valves at float valves
- Insulation and labelling of pipe-work.
- Cross connections between public and private water supplies, (Bore Wells linked to NI Water supplies within private premises).
- Rain Water Harvesting systems not being installed in compliance with British Standards and the Regulations.
- Shallow service pipes providing insufficient protection from ground frost penetration.

Compliance Actions

NI Water, through its Compliance activities, has a graduated process of engaging customers. Appointment letters are issued to customers and these are followed by inspection report findings, which may include recommendations or improvement notices. Customers are given an adequate period of time to comply with notices depending on the level of risk to water supplies associated with the contraventions. Failure to comply with these requests will generate further repeat inspections and notifications; where these requests are not complied with then a non-compliance report is forwarded to the NI Water legal team for appropriate action. Eleven cases have been forwarded to NI Water legal for consideration because of outstanding contraventions.

Disputes

No formal disputes were referred to arbitration in the reporting year.

General Information

Assessed number of high risk premises connected to the NI Water distribution network (i.e. Class 4 and 5 Fluid Category (FC) 302)

There are Circa 40,000 FC4 & 5 premises across Northern Ireland,

NI Water inspected 947 of these premises during the reporting year

Number of Reactive Water Regulation inspections (13) attributed to water quality incidents and NIW observations

NI Water, example of High Level Inspections

Type of Premises
Quarry Industry
Heavy Manufacturing Industry
Aerospace Industry
Food Production Factory
Agricultural Show
MOD/Police Establishment
Animal Feed Storage Facilities
Commercial Dry Cleaning Organisation
Sporting Pavilion
Harbour Terminal
Regional Hospital
Tourist Visitor Centre
Pharmaceutical Business

Information from Connect 2 – Connect 2 is the software system NI Water uses to drive a proactive risk based inspection programme, record findings and advise or direct customers as to what corrective action is required to bring their systems into compliance with the Regulations. NI Water commenced preparations to consider the upgrade or replacement of the existing Connect 2 system, which is built on de-supported IT platforms.

In addition to proactive inspections, NI Water's Water Fittings Regulation team also undertook reactive inspections because of water quality concerns following sample failures. The reactive inspections were carried out following requests for assistance from NI Water staff. The team also conducts occasional reactive inspections because of concerns or requests for assistance from customers and colleagues.

Action taken by NI Water

Reports are submitted to NI Water scientific and operational teams and copies are made available to the Regulator. Customers are required to take remedial action to provide whole site protection and are given Water Fittings Regulation compliance advice.

Appendix 5

Reporting Year Recap

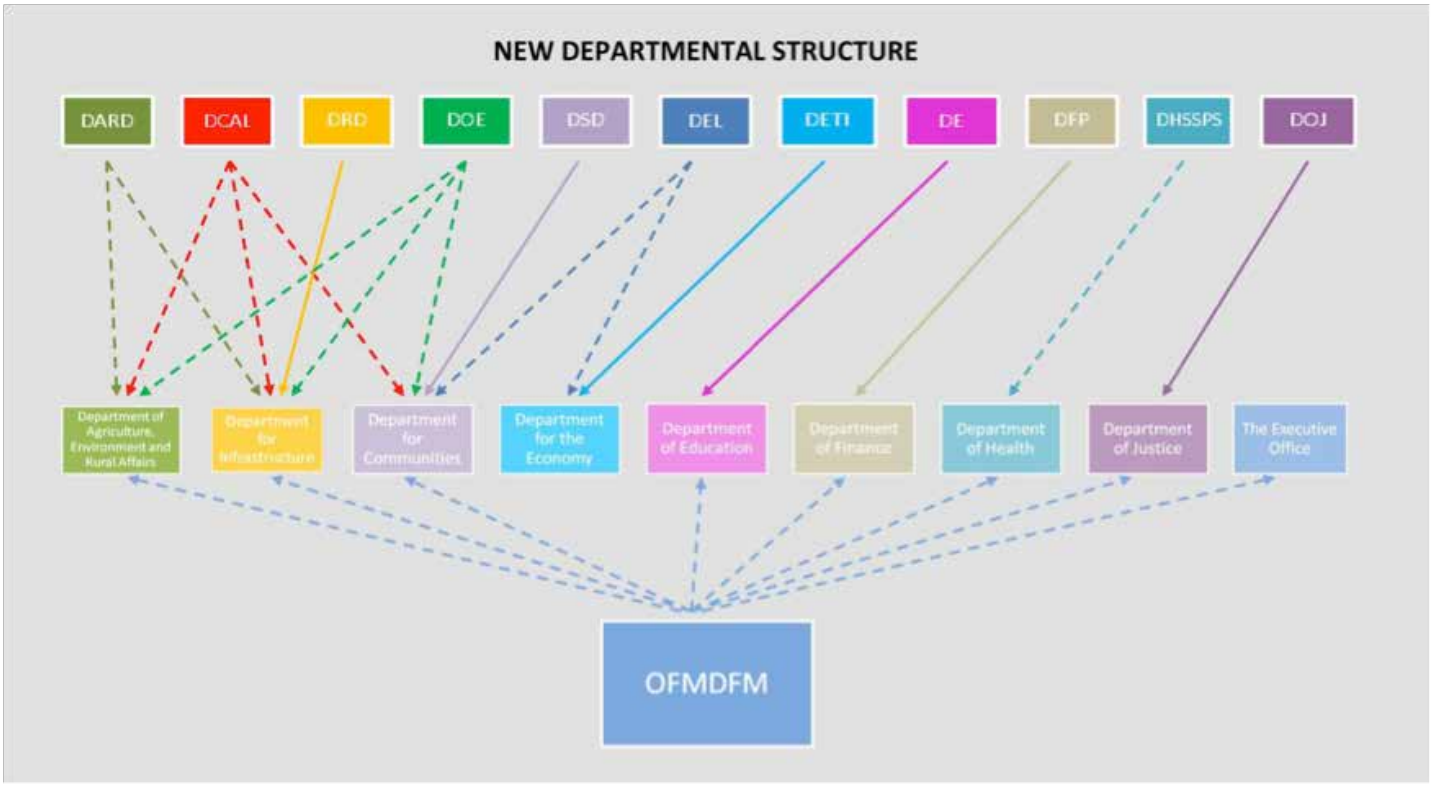
NI Water's Water Fittings Regulations team has in the last reporting year:

- Participated in a notification education campaign aimed at raising awareness of Water Fittings Regulations with Water Industry staff.
  - o Company magazine articles;
  - o Pop up displays; and
  - o Promotional material for call centre staff
- Provided performance measure information on water regulation activities to WRAS for inclusion in a first draft national report. This report was shared with the participating water suppliers and when fully developed will be made public in the next 2-3 years.
- Published its Water Fittings Enforcement policy on the company web site as per a commitment given in the "Keeping Water Safe in Premises" national water industry policy.
- Continued to update, as required, the NI Water, Water Fittings Regulation web page and literature necessary for the compliance of the Regulations and customer compliance guidance.
- Provided a facility on the company website for customers to locate their nearest approved plumbing contractor as registered through WaterSafe (**www.watersafe.org.uk**) and SNIPEF (**www.needaplumber.org**)
- Contributed specialist advice for inclusion in NI Water publications including the winter preparation campaign.
- Promoted compliance with the Water Fittings Regulations at every opportunity and attended conferences, trade shows and agricultural shows, such as the Balmoral Show.
- Participated in water industry national working groups to further explore opportunities to promote regulatory consistency, customer notifications and performance standards reporting across the industry:
  - o Ports and Harbours working group;
  - o Consistency measurers working group;
  - o Performance measurers working group; and
  - o WRAS annual conference in November 2016.
- Reported to DfI (Regulator), along with other "stakeholders", on a quarterly/yearly basis.
- Worked with NI Water procurement section to determine if there are any readily available systems suitable to replace the existing Connect2 system.

Looking Forward

- Progress a business case for the NI Water Board to consider the need to upgrade or replace the current system used for inspection and reporting purposes.
- Continuously develop processes and documentation relating to Water Fittings Regulation inspections and enforcement.
- NI Water will continue to participate with other GB water suppliers facilitated by WRAS in further refining and implementing the National Compliance Policy (Keeping Water Safe in Premises).
- NI Water will continue to promote, at every appropriate opportunity, the general awareness of the Regulations to customers through suitable public and professional interfaces.
- Continue to participate in and benefit from the attendance at WRAS forums.
- Continue to assist SNIPEF in the governance of the approved plumbing contractors' scheme as well as promotional opportunities to raise plumbing standards in Northern Ireland.
- Continuous improvement and refinement of the annual Water Regulation return and interim Regulatory reports.
- Provide WRAS with a performance measurers report detailing activity levels associated with the enforcement of the Water Fittings Regulations in Northern Ireland. This draft report format has been agreed by most UK water suppliers and when finalised will be made publically available over the course of the next 2/3 years.

New Northern Ireland Government Departments in place from May 2016



Appendix 7

Glossary of Technical Terms

Aesthetic	Associated with the senses of taste, smell and sight.
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 customer taps.
Catchment	The area of land that drains into a watercourse.
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 NI Water) against standards and other regulatory requirements.
Contravention	A breach of the regulatory requirement.
CPEO	'Consideration of Provisional Enforcement Order' - first stage in DWI enforcement process.
Cryptosporidiosis	The illness produced by infection with Cryptosporidium.
Cryptosporidium	A protozoan parasite.
Determination	A single analytical result for a specific parameter.
Distribution systems	NI Water'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.
DWSP	'Drinking Water Safety Plan' Based on a comprehensive risk assessment and risk management approach to all the steps in a water supply chain
EO	'Enforcement Order' – third stage in DWI enforcement process.
Event	A situation affecting or threatening to affect drinking water quality.
Exceedance	Synonym for contravention (see above).
Faecal coliforms	A sub-group of coliforms, almost exclusively faecal in origin.

Appendix 7

Filtration	The separation of suspended particulate matter from a fluid.
GPS	Global Positioning System – a satellite based location system which gives an accurate record of position.
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.
LIMS	Laboratory Information Management System – the computer system used by NI Water to record and audit the results of the hundreds of thousands of parameters analysed each year.
Mains rehabilitation	Restoration or replacement of water mains pipework to a proper condition.
MCPA	MCPA is a selective hormone-type herbicide, which is absorbed by the leaves and to some degree the roots.
Mean Zonal Compliance	The former assessment of water quality at a parameter level based on water supply zones.
Microbiological	Associated with the study of microbes.
m3/d	Cubic metres per day.
mg/l	Milligrams per litre.
Qg/l	Micrograms per litre.
ml	Millilitre.
Ml/d	Megalitres per day (one Ml/d is equivalent to 1,000 m3/d or 220,000 gallon/d).
Oocyst	The resistant form in which Cryptosporidium 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 customer water.
PAHs	A group of organic compounds known as polycyclic aromatic hydrocarbons, comprising, for the purposes of the Regulations, four substances: benzo(b) fluoranthene, benzo(k)fluoranthene benzo(ghi)perylene and indeno (1,2,3-cd) pyrene,

Appendix 7

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'.
PEO	'Provisional Enforcement Order' – second stage in DWI enforcement process.
Pesticides	Any fungicide, herbicide or insecticide or related product (excluding medicines) used for the control of pests or diseases.
PHA	The Public Health Agency works to initiate, stimulate, develop and support health promotion.
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.
Protozoan parasites	A single celled organism that can only survive by infecting a host.
Public register	The information made available by NI Water to the public as required by regulation 34 in the Regulations.
Regulations	The Water Supply (Water Quality) Regulations (Northern Ireland) 2007.
Remedial action	Action taken to improve a situation.
RPZs	Reduced Pressurised Zone Valve – a type of backflow prevention device.
SCaMP NI	Sustainable Catchment Management Planning Northern Ireland.
Service reservoir (SR)	A water tower, tank or other reservoir used for the storage of treated water within the distribution system.
SIC Code	Standard Industrial Classification Code – used for Water Fittings Regulations.
Springs	Groundwater appearing at the surface at the outcrop of the junction of an impermeable stratum.
Surface water	Water from rivers, impounding reservoirs or other surface water sources.
Technical audit	The means of checking by the DWI that NI Water 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.

Appendix 7

Trihalomethanes (THMs)	A group of organic substances comprising, for the purposes of the Regulations, four substances: trichloromethane (also known as chloroform), dichlorobromomethane, dibromochloromethane and tribromomethane.
UKAS	The sole national accreditation body recognized by government to assess, against internationally agreed standards, organisations that provide certification, testing, inspection and calibration services.
Utility Regulator	The Northern Ireland Authority for Utility Regulation (NIAUR).
WDPD	DfI Water and Drainage Policy Division. Deemed to be the Regulator for all activities associated with the Water Supply (Water Fittings) Regulations (NI) 2009.
WRAS	The Water Regulation Advisory Scheme. A list of Standard Industrial Classification codes with related fluid categories used to define categories of non-domestic properties.
Water Regulations	The Water Supply (Water Fittings) Regulations (NI) 2009.
Water Safety Plan	A means of ensuring that a water supply is safe for human consumption based on a comprehensive risk assessment and risk management approach to all the steps in a water supply chain from catchment to tap.
Water supply zone (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. NI Water's website is: http://www.niwater.com
Wholesomeness	A concept of water quality which is defined by reference to standards and other requirements set out in the Regulations.

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