

# Sustainable Water

## A Long Term Water Strategy for Northern Ireland

### Part 2: Drinking Water Supply and Demand



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# Setting the Scene

## Introduction

- 01.** Water is fundamental to life. Safe water supplies are essential to public health, to the development of clean towns and cities, to the economy and to the industrial and agricultural sectors. However, the water we need must be abstracted, treated to a high standard and distributed to our homes and places of work. This has an impact on the local environment where water is abstracted and in the quantities of carbon, chemicals and finance necessary to deliver the service. There is more we all can do to secure an adequate supply of high quality water while reducing our overall impact on the environment.
- 02.** Our inland waters are not only an invaluable source for drinking water but are also an important habitat for a host of aquatic plant and animal life and provide a valuable amenity for recreation and tourism. Extensive abstraction for human use as drinking water, for the irrigation of farm land and for industrial purposes, can place natural ecosystems at risk.

Fofanny Dam Reservoir



**03.** It is also predicted that there will be pressure on water resources in future as a result of changing climatic conditions such as reduced rainfall in summer. In this chapter we will consider how best to deliver safe, secure, sustainable drinking water to households, industry and agriculture now and in the future. Our overall strategy for drinking water can be summarised as follows:

- Work with NI Water, the public and the industrial and agricultural sectors to use water more wisely.
- Develop long term plans to secure future water resources taking account of drinking water demands and the impact of climate change.
- Continue to maintain and review Drinking Water Safety Plans to assess risks to drinking water quality and drive further improvements for both public and private water supplies.
- Build in contamination risk resilience in the water supply chain from the source through to consumers' taps.
- Actively manage the land around drinking water sources (known as catchments) to secure water quality and reduce the need for treatment.
- Invest in treatment works to meet drinking water quality standards and maintain the high level of treated water already achieved.
- Continue a programme of water mains rehabilitation to target localised issues such as colour, taste & odour and deliver an improvement in overall water quality.
- Implement a lead strategy to target the risks of lead pipes and comply with the EU lead drinking water standard.

- Work to increase the energy efficiency of drinking water treatment and supply systems and explore opportunities to generate renewable energy from drinking water infrastructure & assets.

## Public Drinking Water Supplies

### Background

**04.** Northern Ireland Water (NI Water) is the statutory water undertaker for Northern Ireland supplying water to over 99% of the NI population. The remainder of the population is served by private supplies. NI Water's operating area is mostly rural and as a result the average length of water main and sewer per household in Northern Ireland is twice that of an average UK company. This requires water and sewage to be pumped long distances. There are 26,700km of water main and 15,250 km of sewer main. Pumping and treating water and sewage is extremely energy intensive. NI Water is our largest single electricity consumer with energy bills of over £30m /year. It is anticipated that this will rise to around £50m by 2020.

### Drinking Water Quality

**05.** The Drinking Water Directive<sup>01</sup> (DWD) sets standards for the most common substances (or parameters) that can be found in drinking water. The aim of the DWD is to protect the health of consumers by ensuring drinking water is wholesome and clean. Over 100,000 tests are carried out each year to monitor the quality of the drinking water across NI Water's supply system for a range of microbiological and chemical parameters. The Drinking Water Inspectorate (DWI) regulates and assesses compliance with

01 Council Directive 98/83/EC



the regulatory requirements to ensure safe, clean drinking water supplies. The results are summarised in its Annual Drinking Water Quality Reports which can be viewed at [http://www.doeni.gov.uk/niea/water-home/drinking\\_water/annual\\_reports.htm](http://www.doeni.gov.uk/niea/water-home/drinking_water/annual_reports.htm). Figure 2.1 below shows how overall drinking water quality compliance has been improved over the last 8 years. This has been achieved through sustained investment in water treatment facilities and on mains rehabilitation. Since 2007, the Executive has invested over £500 million to maintain and improve water services.

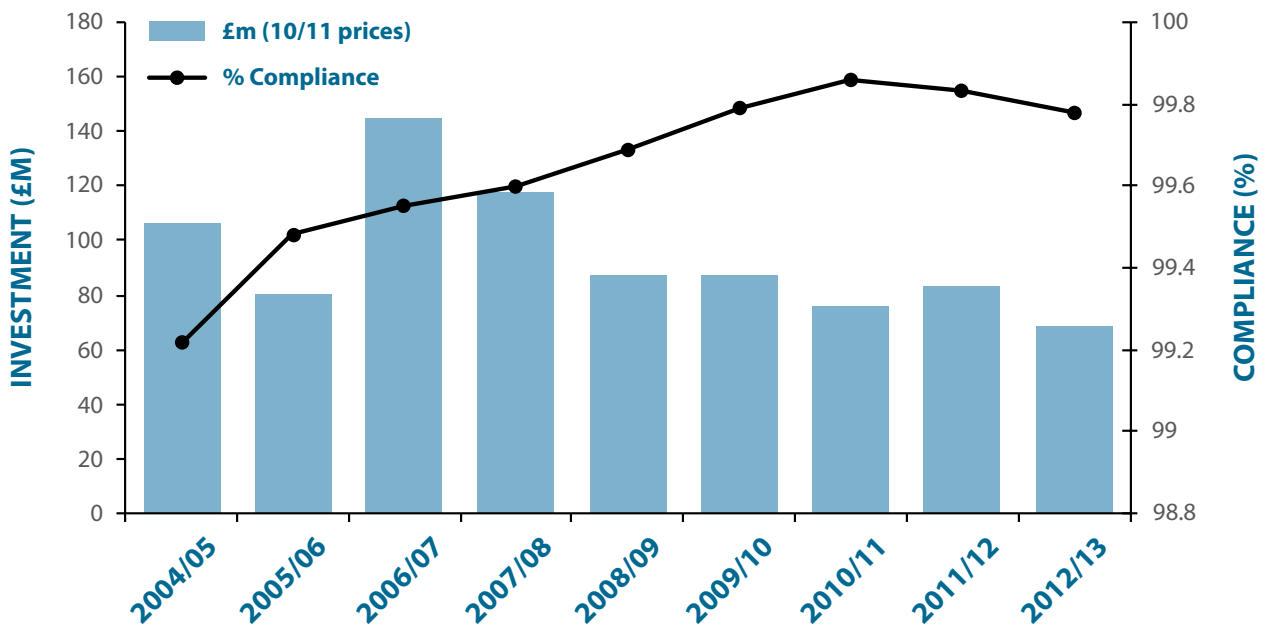
### Water Resources

- 06. It is predicted that there will be pressure on water resources in future as a result of changing climatic conditions such as reduced rainfall in summer. This is

recognised by the Water Framework Directive<sup>02</sup> (WFD) which promotes the sustainable use of water resources and requires users to use water resources efficiently.

NI Water currently abstracts around 559 million litres of water for drinking water every day and is authorised to abstract up to 1,045 MI/d under license<sup>03</sup>. Water resources are currently limited by NI Water's water treatment capacity of approximately 830 MI/d. These abstraction volumes may need to be rationalised to protect our water sources and meet the aims of the WFD. In addition, it is essential that the quality of raw water in these sources is protected. These water supplies are mainly obtained from surface water sources such as rivers, loughs and reservoirs (99.4%) with 0.6% from boreholes.

Figure 2.1 Drinking Water Quality Compliance



02 Council Directive 2000/60/EC  
 03 Raw water abstraction is licensed by NIEA under the Water Abstraction and Impoundment (Licensing) Regulations (Northern Ireland) 2006.

## Private Supplies

- 07.** Less than 1% of the Northern Ireland population is served by private water supplies. The majority of these are from groundwater sources, most commonly, boreholes. The Drinking Water Inspectorate (DWI) regulates the quality of private supplies with the support of staff from the Environmental Health department of local councils who collect samples, assist in follow-up investigations and carry out risk assessments at private water supplies.
- 08.** There were a total of 122 private supplies on DWI's register in 2012. It is estimated that there are approximately a further 4,000 private supplies to single private dwellings, which are not required to be registered. DWI's results show that out of a total of 6,121 tests carried out on registered private supplies in 2012, 97.66% met the regulatory standards. More information on the quality of private supplies can be found in DWI's Annual Drinking Water Quality Reports<sup>04</sup>.

## Challenges to Drinking Water Supply

- 09.** We often take our water supply for granted. We turn on the tap or flush the toilet and expect water to flow. It is often only when we experience supply interruptions that we take notice of what goes into providing us with safe clean drinking water. It is still a common misconception that water should be free because it falls from the sky and that there is no need to conserve water because we have so much rain. This ignores the fact that it takes a significant amount of electricity and chemicals to

remove impurities to enable the water treatment processes to produce high quality drinking water. Only 4% of treated water is consumed. The majority is used for other purposes (toilets and showers). If we reduce the amount of water we use, our carbon footprint will be smaller. Using fewer chemicals will also be beneficial for the environment.

- 10.** Delivering clean safe drinking water to approximately 818,000 households and businesses currently requires around 559 million litres/day of water to be abstracted, treated and distributed through a supply chain of 24 treatment works, 340 service reservoirs, 372 pumping stations and over 26,700 km of water mains.

This must then be returned to the environment through 15,250 km of sewer mains using 1270 pumping stations to 1,034 wastewater treatment works and 57 sludge management centres. There are therefore many challenges to continuing to provide safe, sufficient supplies of drinking water. Some of the key challenges are set out in Table 2.2 on the next page:

04 [http://www.doeni.gov.uk/niea/water-home/drinking\\_water.htm](http://www.doeni.gov.uk/niea/water-home/drinking_water.htm)

**Table 2.2: Key Challenges Drinking Water Supply**

<b>Funding</b>	Our water and sewerage services currently cost around £380m/yr. Water and sewerage costs are likely to increase with population growth, development and energy price rises. Customers' bills <sup>05</sup> may have to be increased to meet these costs.
<b>Drinking Water Quality Compliance</b>	We continue to enjoy clean safe drinking water, the quality of which achieves high levels of compliance with the regulatory standards. However sustaining these high compliance levels is challenging and will continue to require significant investment to maintain and improve water infrastructure and assets.
<b>Security of Supply</b>	While the quantity of water available for human use is largely sufficient to meet our needs now, this may not be the case in future. Climate change predictions indicate that there will be pressure on water resources in future. Low summer flows in some local rivers are already resulting in a reduction in water available for abstraction in some areas. In addition, we will need to consider the impact of population growth and changing demographics on water demand.
<b>Carbon &amp; Green House Gas Emissions</b>	Maintaining a pressurised water system and providing appropriate treatment requires large amounts of energy. NI Water is our largest single electricity user (over £30m/yr). This energy use is likely to continue rising with future development and growth.
<b>Protecting the Environment</b>	Abstracting large amounts of water can lead to low river flows, water scarcity and can place natural ecosystems at risk. The risk of environmental damage will continue to increase if more water is abstracted to facilitate growth and/or we experience increased periods of dry weather and drought.

05 Domestic water and sewerage bills are currently subsidised by the NI Executive.



## Drinking Water Strategy

### Need for Change

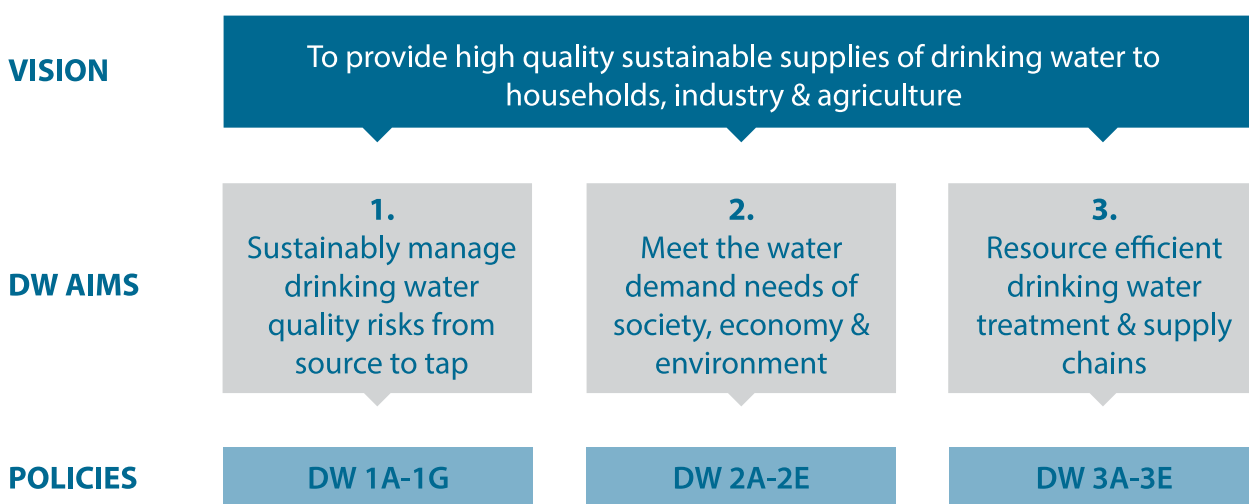
11. Meeting these challenges requires a more sustainable approach to drinking water supply and treatment from the catchment through to consumers’ taps. We cannot afford to reverse the substantial reductions made in the amount of water we abstract from the environment. Nor can we continue to rely on expensive high energy drinking water treatment solutions. We must also actively manage water demand and introduce more sustainable treatment solutions to meet the aims of the Water Framework Directive on the protection and sustainable use of water resources. The proposed long term vision is to **‘provide high quality, sustainable supplies of drinking water to households, industry and agriculture and ensure adequate quantities of water are maintained in the environment’.**

This requires a more sustainable approach to managing the drinking water supply chain from the water source right through to the consumers’ taps. This involves:

- Protecting and improving the quality and quantity of drinking water sources by building in effective contamination risk resilience through enhanced drinking water protection
- Improving the efficiency of drinking water abstraction and treatment
- Maintaining a sufficient supply of high quality drinking water through resilient and efficient distribution systems
- Managing water consumption by improving water efficiency in homes and businesses

The proposed strategy for achieving this Vision is set out in the remaining sections of this chapter and is structured around three key aims and a number of proposed policies as shown in Figure 2.3 below.

Figure 2.3: Proposed Drinking Water Strategy



# DW Aim 1:

## Manage Drinking Water Quality Risks in a Sustainable Manner from Source to Tap

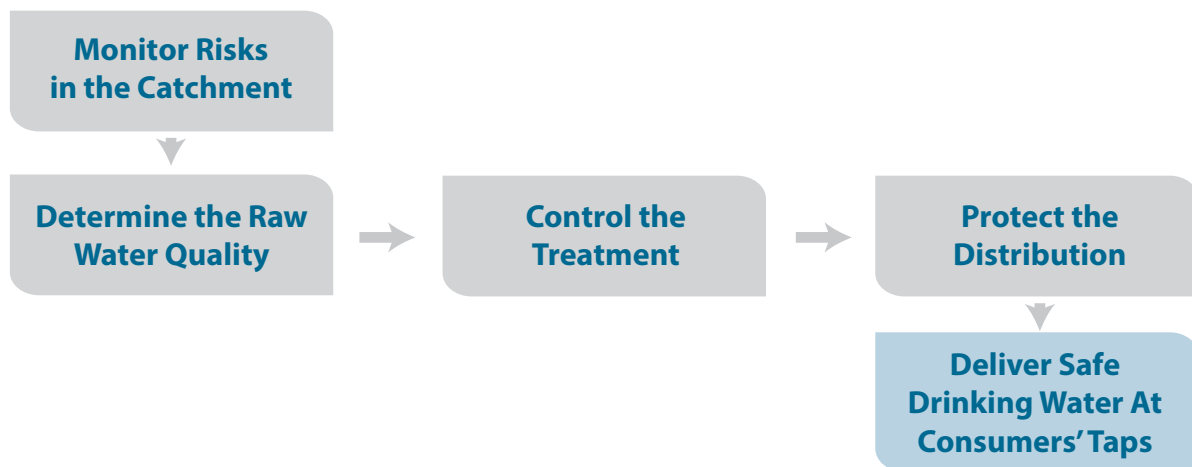
12. Providing high quality drinking water to our homes and businesses involves taking water from the environment, transporting it to a treatment facility and supplying it through a pressurised distribution system to our taps. The water supplied must be of a very high quality and be safe and clean to drink. It is also important to ensure that the drinking water supply process is affordable and not detrimental to the environment. This aim is about identifying and managing potential contamination risks which could affect the quality of the drinking water supply chain. This includes managing the risks of contamination throughout the supply chain whether at the source, the treatment and distribution systems or the supply pipes. The following paragraphs set out a number of policies (DW 1A-1G) for achieving this aim.

### DW Policy 1A:

#### Maintain and review drinking water safety plans for all drinking water catchments

13. NI Water monitors the quality of its drinking water sources to identify potential quality risks (e.g. pesticides and natural organic matter). This is the first stage of the Drinking Water Safety Plan (DWSP) approach required by water quality regulations<sup>06</sup>. This is the most effective way of ensuring that a water supply meets the health based standards and other regulatory requirements throughout the water supply chain. It is based on a comprehensive risk assessment and management approach to all the supply stages from catchment through the treatment process and onwards through the distribution systems to consumers. This is illustrated in Figure 2.4 below.

Figure 2.4 Drinking Water Safety Plan Approach



06 SR147/2007 as amended by SR246/2009 & SR128/2010

- 14.** The primary objectives of DWSPs are the identification and mitigation of risks through the minimisation of contamination of source waters, the reduction or removal of contamination through appropriate treatment processes and the prevention of contamination in the distribution network and the domestic distribution system.

Drinking water safety plans should be maintained and kept under review for all drinking water catchments to inform a prioritised investment programme of mitigation measures.

#### DW 1A Proposed Measures:

- Maintain and review drinking water safety plans for all drinking water catchments.
- Continue to implement a prioritised investment programme to manage drinking water quality risks informed by DWSPs.

#### DW Policy 1B:

Put effective protection measures in place for drinking water sources

- 15.** Protecting the water in areas from which it is abstracted not only improves the raw water quality but can also mitigate against future increases in water treatment costs. This is recognised by the Water Framework Directive<sup>07</sup> (WFD) which requires water bodies used for abstraction for drinking water purposes to be designated as Drinking Water Protected Areas (DWPAs) and appropriate monitoring and protection measures to be put in place. All drinking water sources should therefore be designated as DWPAs to provide appropriate regulatory protection and help prevent future deterioration of drinking water sources in line with WFD principles.

#### DW 1B Proposed Measures:

- Review the designation of all existing (and future) drinking water sources as Drinking Water Protected Areas (DWPAs) and ensure appropriate monitoring and regulatory protection measures are put in place.

#### DW Policy 1C:

Introduce sustainable catchment management at all drinking water sources

- 16.** Contaminants such as organic matter, fertilisers and pesticides that are washed into our drinking water sources can be difficult and expensive to remove through the treatment process. However, it is possible to reduce these contaminants through sustainable catchment management. This covers a wide range of activities including: managing livestock to prevent over-grazing; restoring areas of eroded/exposed peat; improving farm management to reduce pesticide and fertiliser run-off; and education and public awareness campaigns.
- 17.** All land owners should therefore be encouraged to adopt sustainable land management practices to protect and improve raw water quality in DWPAs through education, incentives and enforcement action (where appropriate). Sustainable catchment management is also set out in EP Aim 2 in Part 4 of this strategy.

07 Council Directive 2000/60/EC

18. Figure 2.5 shows a sustainable catchment management scheme in England<sup>08</sup> where a large area of peat bog was stabilised and restored. The first photo shows how overgrazing and weathering can cause erosion of peat bogs. The exposed peat is easily washed into the catchment.

**Fig 2.5 Sustainable Catchment Management**



19. The second photo shows how peat bogs can be restored and protected to prevent organic matter being washed into the water source. This not only improves raw water quality, but also restores valuable habitats and natural drainage systems. The water retention benefits of restoring peatlands can also be important for managing flood risk in the catchment. This is covered in FRMD Policy 2B in Part 3 of this strategy.

20. As one of our largest land owners NI Water can make a valuable contribution to improving raw water quality through sustainable catchment management. Through its SCAMP NI<sup>09</sup> project (<http://www.niwater.com/our-environment/>) NI Water has already begun work in several catchments, including those in the Mourne Mountains, Garron Plateau & River Derg. NI Water will be expected to continue to implement and where appropriate extend its SCAMP project to all of its drinking water catchments. However, it should not be for NI Water alone to improve our catchments. These innovative approaches require coordinated action by many stakeholders including central and local government, private land owners, farmers, environmental protection organisations and local community groups who all have responsibility and an interest in improving the quality of our inland waters.

21. One such example is the Water Catchment Partnership<sup>10</sup> which has been established to help address significant water quality issues in Northern Ireland. Its aim is to proactively work together to promote and raise awareness of best practice when using pesticides in the garden or on the farm, through a voluntary approach to improve water quality.

08 Quiet Shepherd Peat Bog stabilisation carried out by United Utilities in 2009.

09 Sustainable Catchment Area Management Planning

10 The Water Catchment partnership is a working partnership established from representatives from Ulster Farmers Union, Northern Ireland Water, Northern Ireland Environment Agency and DARD's College of Agriculture, Food and Rural Enterprise.

Pesticides include herbicides, weedkillers, fungicides and insecticides. The initial focus is in the Derg catchment and if the project is successful the scheme will be rolled out to other drinking water catchments.

#### DW 1C Proposed Measures:

- Actively encourage sustainable land management practices around DWPA's (through education, incentives and enforcement).
- Establish effective public/community/voluntary sector partnerships to jointly deliver sustainable catchment initiatives and education campaigns to protect and improve raw water quality (e.g. the Water Catchment Partnership).
- Continue to implement and extend the SCAMP project to all drinking water catchments including appropriate monitoring.

#### DW Policy 1D:

##### Manage water quality risks from the water distribution system

**22.** The water distribution system is an extensive and complex network, consisting of 340 service reservoirs and approximately 26,700 kilometres of water mains. As water travels through this system, quality may deteriorate depending on the condition and structural integrity of the distribution system, the nature of the water and the materials with which it comes into contact. For example, service reservoirs whose structural integrity has not been maintained are at risk from ingress of microbiological contaminants, and old cast-iron pipes which have corroded over time may result in discoloured or 'rusty' water at the tap. NI Water has a programme in place to ensure all

service reservoirs are regularly cleaned and checked for integrity. The company also has a disinfection policy in place that ensures a residual disinfection is maintained throughout the water supply system for the protection of human health. Systems are also in place to ensure that disinfection by-products (e.g. THMs<sup>11</sup>) are kept to a minimum while maintaining microbiological safety in line with the Water Supply (Water Quality) Regulations (Northern Ireland) 2007<sup>12</sup>.

- 23.** Many of NI Water's older water mains are made of cast iron. Deterioration in iron mains can result in discoloured drinking water due to the presence of iron or manganese. In 2012, over 60% of all customer complaints on water quality were related to appearance. NI Water has an extensive rehabilitation programme to restore/replace the existing water mains pipe work. This takes into consideration many factors including water quality, water pressure, leakage and bursts. The Water Mains Rehabilitation Programme should continue to focus on preventing service deterioration, targeting water quality issues and addressing consumer complaints.
- 24.** Due to the scale of the network, it can be difficult to determine the exact locations of where water mains have deteriorated. Drinking water quality targets should therefore continue to be developed for the Water Mains Rehabilitation Programme focused on addressing iron contraventions and drinking water quality complaints (particularly complaints in relation to colour, taste & odour).

11 Trihalomethanes (THMs) are chemical compounds that can be formed when water is disinfected with chlorine. THMs occur when chlorine reacts with organic matter (e.g. peat) in water.

12 SR 147/2007 as amended by SR246/2009 & SR128/2010



**DW 1D Proposed Measures:**

- Continue to effectively manage and operate the distribution system to prevent deterioration in drinking water quality.
- Develop drinking water quality targets focused on addressing iron exceedences and consumer complaints.
- Continue Water Mains Rehabilitation Programme focused on preventing service deterioration, targeting water quality issues and addressing consumer complaints.

**DW Policy 1E:****Remove lead pipes and fittings from drinking water supply systems**

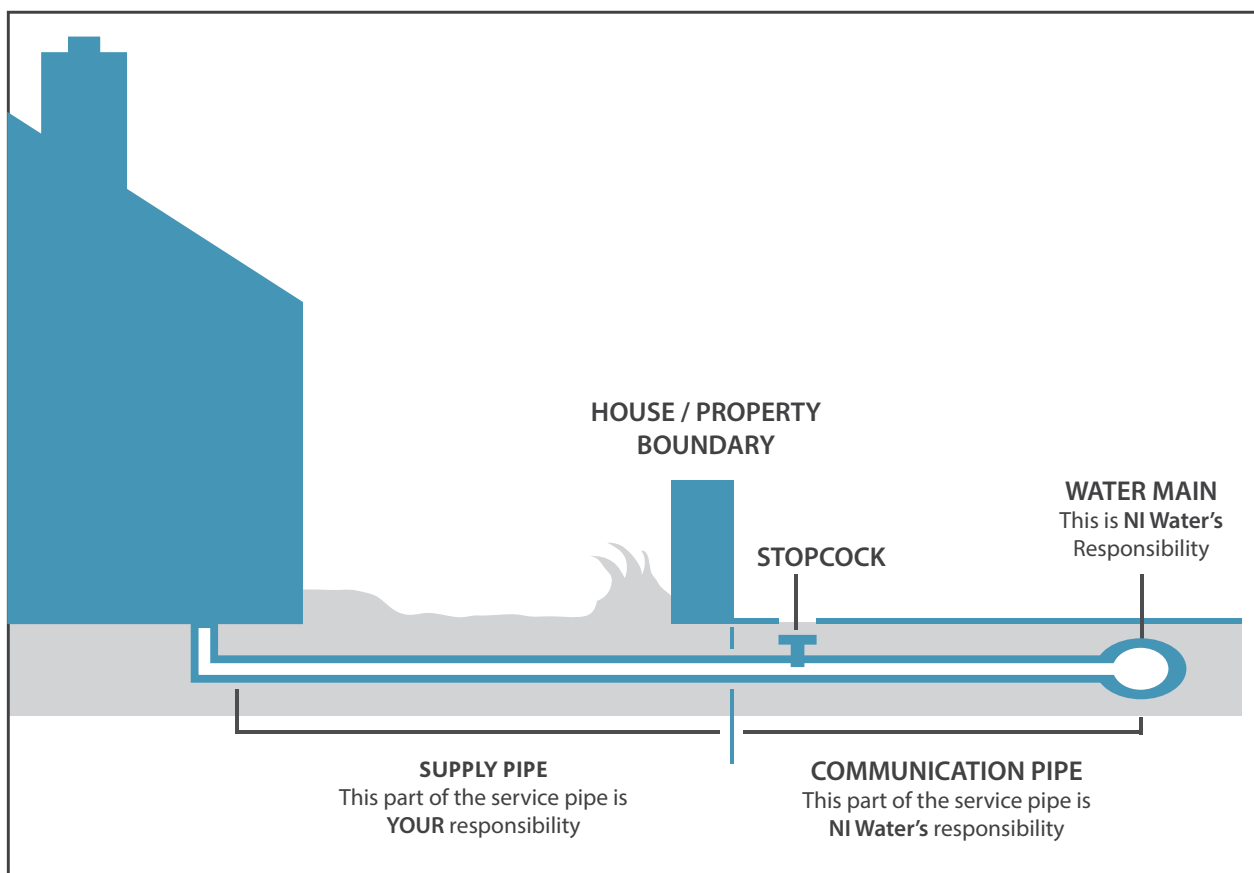
- 25.** Lead occurs naturally in the environment and, for many centuries, was the preferred material used in pipes and conduits for transporting drinking water (the word plumbing is derived from the Latin for lead). This was due to its resistance to corrosion, malleability and smooth surface. Lead was still in common use in the UK for small bore pipes and pipe fittings until the 1970s in both public supplies and private plumbing. Since then the growing evidence base for its detrimental effect on human health has resulted in it being banned from use in potable water supplies. Those at greatest risk from exposure to lead in drinking water are young children and unborn babies. It is a cumulative poison that affects the nervous system and can affect some aspects of child development (both size and intelligence).
- 26.** The World Health Organisation, in its booklet on Childhood Lead Poisoning (WHO, 2010) has drawn attention to (i) recent research that indicates that lead

is associated with neurobehavioural damage at blood levels of 5 µg/dl and even lower (until now, 10 µg/dl has been considered to be the trigger for concern); (ii) there appears to be no threshold level below which lead causes no injury to the developing human brain. Exposure to lead in drinking water has reduced significantly as a result of NI Water's twin-track approach of orthophosphate treatment to reduce plumbosolvency (the tendency of lead to dissolve in water) and the identification and replacement of lead pipes within the NI Water infrastructure. Compliance with the European lead standard for drinking water (10µg/l) has steadily improved over the last 7 years with just over 97% of water samples complying in 2012. NI Water's strategic lead policy and lead pipe replacement programme should therefore continue to focused on improving compliance with the lead standard.

- 27.** 'In-situ' lead pipe work is still prevalent within the boundary of many older properties and is normally privately owned. Figure 2.6 shows the supply pipe arrangements for a typical household. Customers are responsible for the section of service pipe within their property boundary. This is known as the supply pipe. NI Water is responsible for the communication pipe outside the property boundary.
- 28.** Through its Water Mains Rehabilitation Programme, NI Water informs householders when lead communication pipes (from the water main to the property line) have been replaced to encourage them to replace their lead supply pipe work. NI Water will also replace the lead communication pipe when a customer replaces their supply pipe. However less than 20 customers approach NI Water each year and only



**Figure 2.6:** Typical Water Supply Pipe Arrangements



around 20% of properties take the opportunity to replace their supply pipe when the mains rehabilitation work is in their area. These figures show that a significant amount of work is required in addition to the existing NI Water led activities to improve compliance particularly in managing the risk from private lead supply pipes. A long-term Government approach is therefore needed to manage the risk created by privately owned lead supply pipes.

29. NI Water has carried out a desktop analysis to assess the possible quantities of lead in the drinking water system. It is estimated that as many as 100,000 properties could have lead supply pipes. To replace all these pipes could cost tens of millions of pounds. Properties that have or have had lead private supply pipes may also

have lead pipes in their internal plumbing. Although this is beyond both the public supply and drinking water sample point, it is a further risk of lead ingestion and the risk of exposure to lead from these sources needs to be reduced. Education on how to minimise the risks of lead drinking water only from the kitchen tap should be included in any government initiative.

#### **DW 1E Proposed Measures:**

- NI Water should continue implementing its strategic lead policy and lead pipe replacement programme focused on removing all lead pipes from the public supply system and improving compliance with the EU Lead standard (10µg/l).

- An approach to the management of private supply pipes including the removal of lead from private supply pipes should be developed to meet the EU lead standard (10µg/l) and provide safe wholesome supplies of drinking water.
- An education programme should be developed to highlight the risks posed by lead (including lead in internal plumbing) and how exposure to lead from drinking water can be reduced / eliminated.

connected to the public water supply. They help to ensure that any plumbing system in your home or business is installed and maintained correctly. Complying with these Regulations can help to prevent any potential contamination of the public water supply or to other parts of your home or business. NI Water is responsible for enforcing the Regulations in all properties that have a public water supply. More information on the Regulations can be found at <https://www.niwater.com/water-fittings-regulations/>

## DW Policy 1F:

### Managing water quality risks from defective water fittings

**30.** The Water Supply (Water Fittings) Regulations (NI) 2009 set out minimum performance standards for water using apparatus (e.g. toilets, dish washers, washing machines, etc). The Regulations aim to reduce the risk of contamination and reduce wastage of water supplied by NI Water through the use of specified water fittings and methods of installation. The Regulations apply to all plumbing systems, water fittings and appliances

**31.** If you are an owner or occupier of a property or you install or maintain plumbing systems and water fittings you have a legal obligation to meet the requirements of the Regulations. In addition, architects, developers, plumbers and builders need to ensure the requirements are met for future owners or occupiers. In most cases before you start work on plumbing installations or undertake any changes to your water system, you as the owner, occupier or installer must obtain approval from NI Water by giving advance notice of the



work. However in many cases the use of a licensed plumber means that you are not required to give advance notification directly to NI Water. All work undertaken by a Licensed Plumber is also covered by a warranty scheme. A list of licensed plumbers is available from WaterSafe at <https://www.watersafe.org.uk/>.

32. WaterSafe is a dedicated online search facility bringing together thousands of qualified contractors employed by plumbing businesses from the seven existing Approved Contractors' Schemes across the UK. Its aim is to help customers to find the nearest qualified plumbing and heating professionals in their area and promote water safety in the home and for businesses.
33. Approved plumbing businesses must adhere to the WaterSafe customer commitments, conditions of membership and scheme rules. Where businesses fail to meet these standards a disciplinary process applies. A member business, which fails to uphold the standards will be subject to a range of penalties, in serious cases, this would result in membership of WaterSafe being revoked.

#### DW 1F Proposed Measures:

- Continue to effectively monitor and regulate compliance with the Water Supply (Water Fittings) Regulations (Northern Ireland) 2009 and reduce the risk of contamination or waste of public water supplies through defective water fittings.
- Educate and improve public awareness of the importance of compliant water fittings and using licensed plumbers (Watersafe).

- Ensure all publically owned drinking water systems comply with the Water Fittings Regulations.

#### DW Policy 1G:

##### Manage water quality risks from private water supplies

34. Northern Ireland Water supplies water to over 99% of the population: the remainder of the population is served by private water supplies. Although the number of people served by private water supplies may be small, more people are exposed to them through holiday accommodation (e.g. hotels, bed & breakfast facilities), public buildings such as hospitals and universities, and from the use of private supplies in the manufacture of food and drinks.
35. Private water supplies are required to comply with the same standards as the public water supply and must also have a risk assessment undertaken. The risks of contamination of private water supplies, and rates of non-compliance with quality standards, are higher than for the public supply and these are required to be managed accordingly in order to protect public health. Private supplies often abstract from groundwater sources and have minimal treatment infrastructure in place and can present different risks from those presented in public systems. For example, private supplies can be particularly susceptible to contamination by coliforms as a result of agricultural runoff.

#### DW 1G Proposed Measures:

- Maintain an effective water quality monitoring programme for private supplies.

- Work with water regulators, district councils and private supply owners to further develop risk assessments at private water supplies to ensure Water Safety Plans are in place at private water supplies.

### DW Policy 1H:

#### Manage water quality risks for domestic distribution systems

**36.** Where there is a public water supply to buildings, such as hospitals and schools, the building owners must ensure that there is no deterioration in the drinking water quality as a result of the distribution of the water throughout the site. This onward distribution of the water through the building's domestic distribution system is regulated to ensure that it does not present a risk to members of the public. The Drinking Water Inspectorate has responsibility to ensure that appropriate remedial measures are taken by the building owner, where there are water quality failures identified under domestic distribution system regulations and which are related to the onward distribution of water within these buildings.

#### DW 1H: Proposed Measures:

- Continue monitoring and regulation of domestic distribution systems.
- Government will commence a programme of improvement to government owned domestic distribution systems.
- Develop and implement an education programme to increase public awareness of the importance of properly maintained and monitored domestic distribution systems.

- Promote the use of a Water Safety Plan approach within buildings where water is made available to the public in line with WHO principles.
- Promote the use of a Water Safety Plan approach within buildings where water is made available to the public in line with WHO<sup>13</sup> principles.

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13 <http://whglibdoc.who.int/publications/2011/9789241548106.eng.pdf>

## DW Aim 2:

### Meet the Water Demand needs of Society, the Economy and the Environment

- 37.** NI Water supplies around 559 million litres/day of water to approximately 818,000 properties. This is a difficult task during normal climatic conditions but becomes extremely challenging during extreme weather. This was illustrated with the major supply issues that resulted from the freeze-thaw event in December 2010. Climate change predictions indicate that the frequency of extreme weather events is likely to increase. It is also predicted that lower flows will be available for abstraction in future. Demand for water may also increase due to population growth and economic development. We will need to ensure that environmental flows in rivers and streams are protected to support biological diversity. NI Water is currently authorised to abstract up to 1,045 Ml/d under license<sup>14</sup>. However, these abstraction volumes may need to be rationalised to protect our water sources and meet the aims of the Water Framework Directive. The energy required to treat and supply drinking water is also of concern: it is projected that NI Water's energy bill will rise to around £50 million per year by 2020 as energy costs, treatment and supply requirements increase.
- 38.** This aim is about ensuring that a secure, resilient supply of water is available to meet the water needs of society, the

economy and the environment in future. For this to be sustainable we must move towards making our use of drinking water more sustainable by reducing our demand for water and by reducing waste as we consume water. Reducing water demand has the benefit of improving energy efficiency, security of supply and reducing the impact on the environment. This will require improvements to the water supply system to reduce leakage and improve water efficiency in homes and businesses and promote water re-use and recycling. The proposed long-term target is to reduce average consumption from 155 l/h/day (2013) to 130 l/h/day by 2039.

#### Consultation Question DW 1

In England and Wales, water scarcity is already a major issue (particularly in the South). The English target is to reduce average consumption to 130 l/h/day by 2030. It is proposed that NI should adopt a similar consumption target for 2039.

- Do you support the need for a long-term water consumption target?
- Should the NI target be the same as that of England and Wales?
- Should average consumption per head be used as the measure?
- Do you think the proposed target to reduce average consumption (currently at 155 l/h/day) to 130 l/h/day by 2039 is challenging?

#### DW Policy 2A:

Provide access to efficient safe secure drinking water supplies

- 39.** Approximately 99% of the population are currently connected to the public drinking water supply network. The long-term aim is to connect as many properties as possible to the public supply system

<sup>14</sup> Raw water abstraction is licensed by NIEA under the Water Abstraction and Impoundment (Licensing) Regulations (Northern Ireland) 2006.

where this is requested by the customer and assessed to be economically viable. NI Water provides a contribution towards the initial cost of providing a connection. In addition, the Northern Ireland Executive provides a further financial contribution to ensure that the cost of new water connections remain affordable to householders and businesses. More information on water connections can be found at <http://www.NIWater.com/water/>.

- 40.** However it is not possible to provide and maintain a public supply to all properties. The infrastructure and operational costs associated with pumping drinking water to isolated rural dwellings on elevated sites can be prohibitive. For this reason in 2012 the Executive introduced a Rural Borewells Scheme which provides financial assistance for the construction of a private borewell and treatment to enable applicants to obtain a wholesome water supply in rural areas. The scheme is primarily aimed at properties that were built before 2000 and occupied as principal residences. In the first two years of the scheme (2012/13) 77 properties have received wholesome private drinking water supplies through the scheme. More information on the Rural Borewells Scheme can be found at <http://www.dardni.gov.uk/index/rural-development/>.
- 41.** To manage future water supply costs it is important that any planned development can be efficiently served by the public drinking water supply system. This is recognised in the Regional Development Strategy<sup>15</sup> which recommends that land-use planning should be informed by current water and sewerage infrastructure

and future investment programmes. This will involve close cooperation between planning authorities and the water industry in the preparation of local development plans and water investment programmes.

#### DW 2A Proposed Measures:

- Continue providing financial assistance towards the initial cost of providing a water connection to encourage connections to the public supply system.
- Continue to use the Rural Borewells Scheme to provide alternative wholesome drinking water to properties that cannot economically or technically be provided with a public supply.
- Develop better mechanisms to ensure that NI Water and the planning authorities effectively integrate water investment and development plans and ensure customers' water needs are efficiently met in the future.

#### DW Policy 2B:

Water resource management and drought planning to inform long-term investment needs

- 42.** NI Water's Water Resource Management Plan (WRMP) sets out its strategy for maintaining drinking water supplies over the period 2010 to 2035. The WRMP takes into account forecast changes in population, housing and water usage and incorporates any predicted changes to our climate. The average volume of water needed in the supply system has reduced from around 735 Ml/day in 2001/02 to around 559 Ml/d. This reduction equates to around 70 Olympic-sized swimming pools per day and has been achieved through sustained investment in water mains to reduce leakage along with

15 <http://www.drdni.gov.uk/shapingourfuture/>



reduced demand particularly in the industrial sector. However water demand needs to be reduced further if we are to protect our water sources, facilitate future development and reduce the carbon and financial costs of drinking water provision in the future.

- 43.** In addition to a WRMP, NI Water is also required to produce a Drought Plan setting out measures needed to safeguard drinking water supplies and the environment during a period of drought. The WRMP and Drought Plans are currently required to be produced and reviewed at different intervals which don't align with current investment cycles. The DRD Minister is proposing to simplify current legislation to require preparation of a single water resource management and drought plan to be prepared and reviewed at regular intervals to inform water investment plans. The plan should also identify adaption and resilience measures in response to climate change predictions and take account of NIEA's proposed review of water abstraction and impoundment licences.

#### DW 2B Proposed Measures:

- Amend existing legislation to facilitate the development of a single water resource management, resilience and drought plan.
- Develop and issue Guidance for developing a joint water resource management and drought plan.
- NI Water should follow this Guidance in preparing the plan which should be published by 1 April 2017.

#### DW Policy 2C:

Put effective systems and processes in place to avoid over abstraction

- 44.** The Water Abstraction and Impoundment (Licensing) Regulations (Northern Ireland) 2006<sup>16</sup> provide controls on water abstractions and impoundments in Northern Ireland.

All significant operators like NI Water who have a licence to abstract from surface water under the regulations are required to have monitoring systems in place or with respect of hydro operations to produce a monitoring plan 3 months prior to commencement of the operation.

- 45.** NIEA needs accurate information on abstractions to carry out its duties<sup>17</sup> and meet the WFD's objectives on promoting sustainable water use and preventing deterioration of, and protecting/enhancing the water environment. NIEA is planning to carry out a review of abstraction licences and introduce flow monitoring at all drinking water sources which are not meeting high or good water resource flow standards in line with the WFD. This review should factor in the costs of abstraction licences. It is also proposed to make continuous flow monitoring a condition of all new significant abstraction proposals.

- 46.** Every day NI Water currently draws around 570 MI/Day from the environment and supplies around 559 MI/day of drinking water. The additional water used is needed in the treatment processes. NI Water has active licenses to abstract up to 1,045 MI/day. This ensures that NI

16 SR 2006/482

17 Duties under the Water Environment (Water Framework Directive) Regulations Northern Ireland 2003

Water has access to additional raw water reserves to enable supplies to continue during a major supply incident such as a trunk main burst, the closure of a treatment works or a freeze-thaw event.

47. However, NI Water must ensure that it doesn't abstract more water than it needs even during extreme events. It is therefore important that the abstraction and treatment processes are efficient and effective and that all water abstracted is used directly for supply or for water treatment processes.

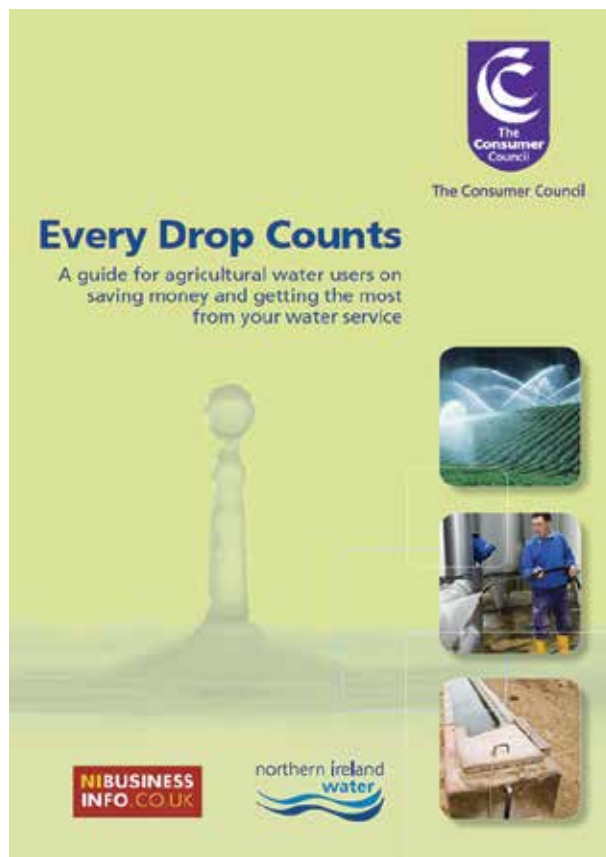
#### DW 2C Proposed Measures:

- Review the effectiveness of drinking water abstraction processes to ensure all water taken from the environment is needed for supply and/or treatment.
- Develop, agree and implement drinking water abstraction monitoring and management plans.
- Manage and review abstraction licences to ensure sustainable water resources are available to meet society's needs without compromising the environment. This will factor in the costs of future abstraction reductions (e.g. new treatment works or trunk mains).

#### DW Policy 2D:

Encourage households & businesses to be water efficient

48. The proposed long-term target is to reduce average water consumption from 155 l/h/day to 130 l/h/day. The Water Framework Directive<sup>18</sup> (WFD) promotes the sustainable use of water resources through water pricing. Water pricing



arrangements for the agriculture and industrial sectors have been in place for many years. The majority of these customers are metered and charged according to usage. This is in line with the WFD's requirement for users to use water resources efficiently and promotes the polluter pays principle.

49. It is recognised that metered water charges are the most effective means of incentivising consumers to conserve and use water efficiently. The continued roll-out of meters to non-domestic customers should further incentivise efficient water use in this sector. However other water efficiency initiatives should also continue to be implemented to incentivise reduced consumption. Current initiatives include the Water Champions Awards, developed by the Consumer Council, with the support of Invest NI and NI Water. This

18 Council Directive 2000/60/EC

award is aimed at helping businesses and farms improve water efficiency and save money on bills. Consumer Council have also produced an 'Every Drop Counts'<sup>19</sup> guide to help businesses and farms improve their water efficiency, get the best service and save money on their bills.

- 50.** It is considered households pay around half the costs of their water and sewerage services through their domestic rates. The remaining costs are made up by Government subsidy paid to NI Water on behalf of households. The Executive is currently considering options for the long-term governance and funding of water and sewerage services beyond 2015. In the absence of metered water charges, households should continue to be encouraged to use water efficiently through targeted education and public awareness campaigns.
- 51.** NI Water already provides 'free' education programmes tailored to the school curriculum. This includes classroom visits, tours of its facilities, an interactive educational section on its website and the Water Bus - a double-decker bus transformed into a mobile education unit. It concentrates on the many aspects of water and is aimed at Key Stage 1 & 2 pupils.



- 52.** If you would like the Water Bus to visit your school or event, please contact NI Water at [education@NI Water.com](mailto:education@NIWater.com) or 02890 354716. In addition, NI Water carries out public awareness campaigns such the 'Don't Wait, Insulate' winter preparation campaign.
- 53.** A recent study called 'At Home with Water'<sup>20</sup> carried out by the Energy Savings Trust has shown that water efficiency can reduce energy bills. On average, 16% (or £228) of a household's annual energy bill (electricity and gas/oil) is from water-using activities. Heating water for showers, baths, washing up and electrical appliances contributes to a lot of energy bills. But this link often goes unnoticed by householders. For example, if every household in the UK took just one minute off one shower every day, it would save £215M in energy bills a year nationwide.
- 54.** This link between water consumption and energy bills should be used to encourage households to use water more efficiently and meet the aims of the WFD. This should be carried out through effective education and public awareness campaigns.

#### DW 2D Proposed Measures:

- Continue with a programme to install meters for non-domestic water and sewerage customers.
- Continue to invest in education and public awareness campaigns to promote water efficiency and the value of water supported by continued work of the water bus and school visits, and other educational means.

19 <http://www.consumerCouncil.org.uk/businesses/water-issues/our-position-on-water-reform/>

20 <http://www.energysavingtrust.org.uk/About-us/The-Foundation/Our-pioneering-research>

- Develop and implement a public awareness campaign highlighting the benefits of water efficiency and how it can lower energy bills.

### Consultation Question DW 2

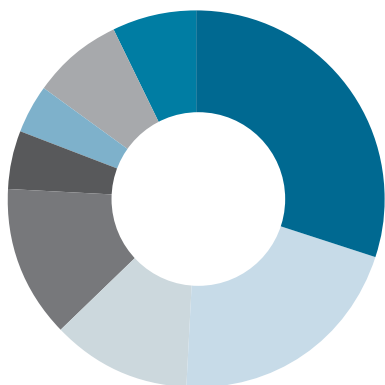
How should households be encouraged to efficiently use drinking water and meet the aims of the Water Framework Directive?

01. Education & Public Awareness Campaigns
02. Requiring water savings devices & measures (e.g. water butts, aerated shower heads, etc)
03. Introducing metered household water charges
04. combination of all or some of the above options
05. Other - please specify?

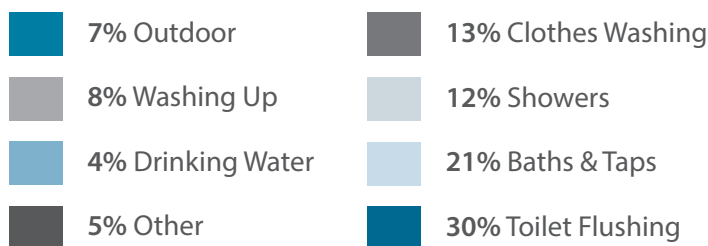
### DW Policy 2E:

#### Deliver water efficient residential & commercial development

55. Only around 4% of water supplied to an average household is used for drinking. Toilets account for around 30% of drinking water consumption. Properties can be built or modified to be more water efficient in high consumption areas. For example, new properties could include recycling systems where grey water from washing machines is used for toilets.
56. The Regional Development Strategy<sup>21</sup> recognises the need to manage water demand in new developments. Regional Guidance (RG12) recommends that ‘consideration should be given to including measures such as grey water recycling and rainwater harvesting’. Planning policy should be amended to ensure all future development is water efficient. An average water consumption limit of 105 l/h/day should be applied to all new residential developments. Research<sup>22</sup> suggests this is a reasonable target. Buildings Standards should also be amended to include a performance rating for water usage to ensure water efficiency/recycling measures are installed in all new developments.



Average Water Usage In One Household Per Day (Ni Water)



21 <http://www.drdni.gov.uk/shapingourfuture/>

22 This is applied to new homes in England - <http://www.environment-agency.gov.uk/research/library/publications/41043.aspx>

57. To inform this policy, pilot projects should be undertaken to test and approve different water efficiency / reuse technologies. Water savings devices such as aerated shower heads and water butts can also be retro-fitted into existing properties. Consumers should be encouraged to install these measures through public awareness campaigns or a grant scheme. It is recognised that some of the more expensive water savings measures such as water recycling may not be cost effective for existing households in the absence of water charges.

#### **DW 2E Proposed Measures:**

- Amend planning policy to ensure all future residential development is water efficient and achieves a maximum consumption figure of 105 l/h/day.
- Complete pilot projects to test and compare the cost effectiveness of different water efficiency / reuse technologies (for both retro-fitting and new build).
- Consider amending Building Standards to include a performance rating for water usage and ensure water efficiency/recycling measures are installed in all new developments.
- Develop and implement policies in respect of retro-fitting water efficiency/ recycling measures in homes and businesses.



**58.** A significant volume of water can be lost through the process of abstracting water from its source, pumping it to a treatment works, treating the water to a high standard and then pumping it on to service reservoirs where it is distributed through a network of pipes to its final point of use. This process also requires a large amount of energy to transport more than 200 million tonnes of water each year to properties in Northern Ireland. NI Water is our largest single consumer of electricity. In 2012/13 its annual power bill was over £30m. Predicted increases in energy prices could see this rise to around £50m by 2020. This aim is about providing greener more efficient drinking water supply systems to minimise power costs and carbon emissions. This includes reducing leakage, improving energy efficiency and employing renewable energy. Proposed policies are set out in the following paragraphs.

### DW Policy 3A:

Achieve a sustainable economic level of leakage (SELL) in all supply systems

**59.** In order to provide sufficient water pressure at our taps and showers water must be pumped at pressure through the distribution system. This causes water to leak from any defects in the system. This water has been abstracted, treated and pumped through the system and has financial and environmental costs. It is therefore important that leakage is kept to a minimum. However, with a pressurised system of over 26,700 km of pipe with

thousands of joints vulnerable to ground conditions and traffic pressure, it will never be possible to reduce water leakage to zero. Through NI Water’s annual water mains rehabilitation programme, 1,503 km of water mains were renewed between 2007 and 2013. This has improved water quality, pressure, supply interruptions and leakage.

**60.** In 2008/09, NI Water reported leakage of 181 MI/day. Since then NI Water has reduced losses to 162 MI/day in 2012/13. In addition NI Water has made the transition to new Netbase Leakage Management Software which complies with best practice. By end of the PC15 period (31 March 2021), NI Water aims to achieve and maintain a sustainable economic level of leakage (SELL) of 159 MI/day<sup>23</sup>. The SELL is the level of leakage where it becomes economically and environmentally (in carbon terms) unviable to invest in further leakage reductions. This is because the cost of water being lost is less than the investment needed to fix the leakage. The Water Mains Rehabilitation Programme should continue to focus on leakage detection and reduction with the aim of achieving the SELL. However, the long term plan should be to go beyond the SELL to encourage innovation and new technologies and processes which reduce leakage further.

**61.** Water leakage not only occurs in the public supply systems but also occurs in customers’ supply pipes. It is estimated that over one quarter of leakage occurs in the private supply within customers’ property. During the major freeze-thaw events in December in 2010 it was estimated that 80% of all water lost was

23 Subject to validation by the Utility Regulator



due to bursts on private supply pipes. NI Water informs customers where it identifies private side leakage and follows this up to check that it has been rectified. For metered non-domestic customers, there is a clear financial incentive to fix the leak. However, for non-measured non-domestic customers and households, there is no incentive to fix a leak unless it is impacting on drinking water quality or pressure. A policy on reducing private supply pipe leakage therefore needs to be developed.

#### DW 3A Proposed Measures:

- The current focus of achieving and maintaining the Sustainable Economic Level of Leakage within the public distribution system should continue and be used to inform the water mains rehabilitation programme.
- A policy on reducing private supply pipe leakage should be developed and implemented.

#### DW Policy 3B:

Improve the energy efficiency of the public drinking water supply system

- 62.** NI Water has an energy efficiency programme in place. Developments in water treatment and supply technology can contribute to improving the energy efficiency of the water supply system. In future this could include installing energy efficient pumps and shortening water distribution distances where feasible. Existing processes and systems should be continually reviewed to identify how energy efficiency savings might be achieved through innovative management and procurement of its assets and infrastructure. For example, taking account of whole-life energy/ carbon costs in project appraisals will

help promote low energy asset or infrastructure solutions. The gradual introduction of more sustainable approaches to drinking water supply will help manage future increases in energy consumption.

#### DW 3B Proposed Measures:

- Review existing water treatment and supply systems to identify how potential energy efficiency savings might be achieved.
- Develop and implement a programme of energy efficiency improvements across the water and sewerage infrastructure and asset base.
- Develop short and long-term energy efficiency targets for NI Water through the water industry price control process (PC15/21/27).
- Revise NI Water's project appraisal process to ensure that drinking water investment decisions are based on 'whole-life' energy and carbon costs.

#### DW Policy 3C:

Increase the use of renewable energy in the public drinking water supply system

- 63.** Due to our local demographics and rural landscape, it is recognised that large amounts of energy will continue to be needed to treat and pump drinking water large distances, no matter how efficient the supply systems are. To minimise carbon emissions, it is important that NI Water secures as much of this energy as possible from renewable sources such as wind, solar, hydro and anaerobic digestion. This should include exploring options to produce more energy in house through use of hydro and wind turbines at water treatment facilities. This applies to the operation of both existing and new assets and infrastructure.

### DW 3C: Proposed Measures:

- Invest in renewable energy generation (e.g. solar panels & wind turbines) to reduce reduce running costs at existing drinking water facilities.
- Generate renewable electricity through innovative management of drinking supply systems (e.g. generating hydro-power from excess water mains pressure).
- Set targets for incentivising NI Water to increase the percentage of renewable energy generated by use of its own assets and lands and contribute to achieving the Executive’s greenhouse gas emissions reduction target.

### DW Policy 3D:

#### Reduce the amount of chemicals used in the drinking water treatment & supply systems

**64.** The drinking water treatment process requires a range of chemicals to remove impurities and to disinfect the water to make it safe. For example, chlorine is used for disinfection and orthophosphoric acid is added to ensure tap water has not dissolved additional impurities from lead pipes along the way. The use of these chemicals in the treatment process is carefully monitored by NI Water and approved by the Drinking Water Inspectorate (DWI) to ensure that drinking water at the tap achieves stringent quality standards. Although the use of these chemicals is essential to ensure safe drinking water, they can have a negative impact on the environment if their use is not effectively managed and controlled. Treatment chemicals need to be effectively managed and monitored during all stages of the treatment process. This includes proper management of water which has been used in the treatment process and then returned to

waterways to keep lake and river pollution incidents to a minimum. In the long term we should seek to minimise the use of chemicals by improving raw water quality through natural means such as SCAMP (DW Policy 1C) and by improving the supply system to minimise the amount of chemicals needed. A reduction in water demand could also assist in reducing chemical consumption.

### DW 3D: Proposed Measures:

- Minimise the use of chemicals by improving raw water quality through natural means such as SCAMP (DW Policy 1C) and by improving the water supply system to minimise the amount of chemicals needed (e.g. orthophosphate).



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# Glossary

<b>Catchment</b>	The area drained, either naturally or with artificial assistance, by a watercourse, including all drainage channels, tributaries, floodplains, estuaries and areas of water storage.
<b>Consumer Council</b>	The Consumer Council for Northern Ireland. CCNI represents the interests of water and sewerage customers to NIW and Government.
<b>DEFRA</b>	Department for Environment Food and Rural Affairs. National Government Department based in London.
<b>DETI</b>	The Department of Enterprise, Trade and Investment.
<b>DOE</b>	The Department of the Environment. Regional Government Department based in Belfast.
<b>Drinking Water Inspectorate (DWI)</b>	The Drinking Water Inspectorate monitors and regulates public drinking water supplies on behalf of the Department for Regional Development. It monitors and regulates private water supplies on behalf of the Department of the Environment.
<b>DW</b>	Drinking Water.
<b>Eutrophic</b>	A body of water whose oxygen content is depleted by organic nutrients.
<b>European Union</b>	The European Union (EU) is an economic and political union of 27 member states, located primarily in Europe. It was established by the Treaty of Maastricht on 1 November 1993 upon the foundations of the pre-existing European Economic Community.
<b>European Commission</b>	The European Commission (formally the Commission of the European Communities) is the executive branch of the European Union. The body is responsible for proposing legislation, implementing decisions, upholding the Union's treaties and the general day-to-day running of the Union. <a href="http://en.wikipedia.org/wiki/European_Commission_-_cite_note-Europa_Institutions-0#cite_note-Europa_Institutions-0">http://en.wikipedia.org/wiki/European_Commission_-_cite_note-Europa_Institutions-0#cite_note-Europa_Institutions-0</a>
<b>European Directive</b>	European Directives are laws which apply in European Union countries. Examples include: the Drinking Water Directive; the Urban Waste water Treatment Directive; the Water Framework Directive and others.

<b>International River Basin District</b>	A river basin / catchment which crosses over into the Republic of Ireland.
<b>Investment Strategy for Northern Ireland</b>	The Investment Strategy for Northern Ireland sets out the Executive's priorities for investment in infrastructure (for example new roads, hospitals or sewers) for the years 2011 to 2021.
<b>Mean Zonal Compliance (MZC)</b>	This is the figure used to compare the quality of drinking water from one region to another. It is represented as a percentage figure. MZC in 2012 was 99.8%.
<b>NIEA</b>	The Northern Ireland Environment Agency.
<b>NI Water</b>	Northern Ireland Water.
<b>PC15</b>	Price Control 2015-2021. The PC Process is the process by which NIAUR determines what NIW should deliver during the period by agreeing a business plan for the company.
<b>Planning Service</b>	The Planning Service is part of DOE and is responsible for developing and implementing Government planning policies and development plans.
<b>Protected Areas</b>	This includes: Areas of Special Scientific Interest (ASSIs), Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Nature Reserves, Marine Nature Reserves (MNRs), Ramsar Sites, Natura 2000 Sites, Areas of Outstanding Natural Beauty (AONBs) & World Heritage Sites.
<b>Raw Water</b>	Water abstracted for drinking water purpose before treatment.
<b>RBMP</b>	A River Basin Management Plan contains a range of measures aimed at protecting, improving and sustaining the use of the water environment, from source to sea.
<b>Regional Development Strategy (RDS)</b>	The RDS sets out the Executive's broad plans for the future development and planning up to 2025.
<b>RIA</b>	Regulatory Impact Assessment. A RIA is an assessment of the impact of a policy in terms of its costs, benefits and risks.
<b>River Basin District</b>	The area drained, either naturally or with artificial assistance, by a watercourse, including all drainage channels, tributaries, floodplains, estuaries and areas of water storage.

<b>Sustainable Development Strategy (SDS)</b>	The SDS sets out how the Government intends to achieve a balance between its economic, social and environmental goals.
<b>Section 75</b>	Section 75 of the Northern Ireland Act 1998. This law requires the Government to have due regard to the need to promote equality of opportunity. Government policies must be reviewed, in a process known as 'screening'. If this screening identifies a potential equality issue then an EQIA (see above) must also be completed.
<b>Sewerage system/ infrastructure</b>	A system of pipes and ducting which collects and transports sewage.
<b>Sustainable Drainage System (SuDS)</b>	A drainage system that controls the quantity and quality of run-off waters by providing storage in tanks or ponds. This delays or prevents discharge to streams or rivers until there is capacity to accommodate it.
<b>SELL</b>	The SELL is the level of leakage where it becomes economically and environmentally (in carbon terms) unviable to invest in further leakage reductions. This is because the cost of water being lost is less than the investment needed to fix the leakage.
<b>UREGNI</b>	The Utility Regulator for Northern Ireland (UREGNI) is responsible for regulating the electricity, gas, water and sewerage industries in Northern Ireland, promoting the short- and long-term interests of consumers.
<b>Water Resource Management Plan</b>	A water resources plan shows how a water company intends to maintain the balance between supply and demand for water over the next 25 years.
<b>Waste Water Treatment Works (WWTWs)</b>	The treatment plant or site where sewage/waste water is received, treated and discharged.
<b>Watercourse</b>	A stream, river, canal, ditch, drain, cut, culvert, dyke, sluice, valve, overland carrier, millrace or layde. Water mains and sewers are not included in this definition.
<b>Water Framework Directive</b>	The European Water Framework Directive is a wide-ranging piece of legislation covering all water bodies including rivers, lakes, estuaries, coastal waters and ground waters. It was established in law in Northern Ireland in 2003 through the Water Environment (WFD) Regulations (Northern Ireland) (SR 2003 No. 544).



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**Water Safety Plan**

A Water Safety Plan (WSP) 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.

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**Water Treatment Works (WTWs)**

The treatment plant or site where raw water is treated to provide safe and wholesome drinking water for public supply.

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## **Water Policy and Shareholder Division**

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