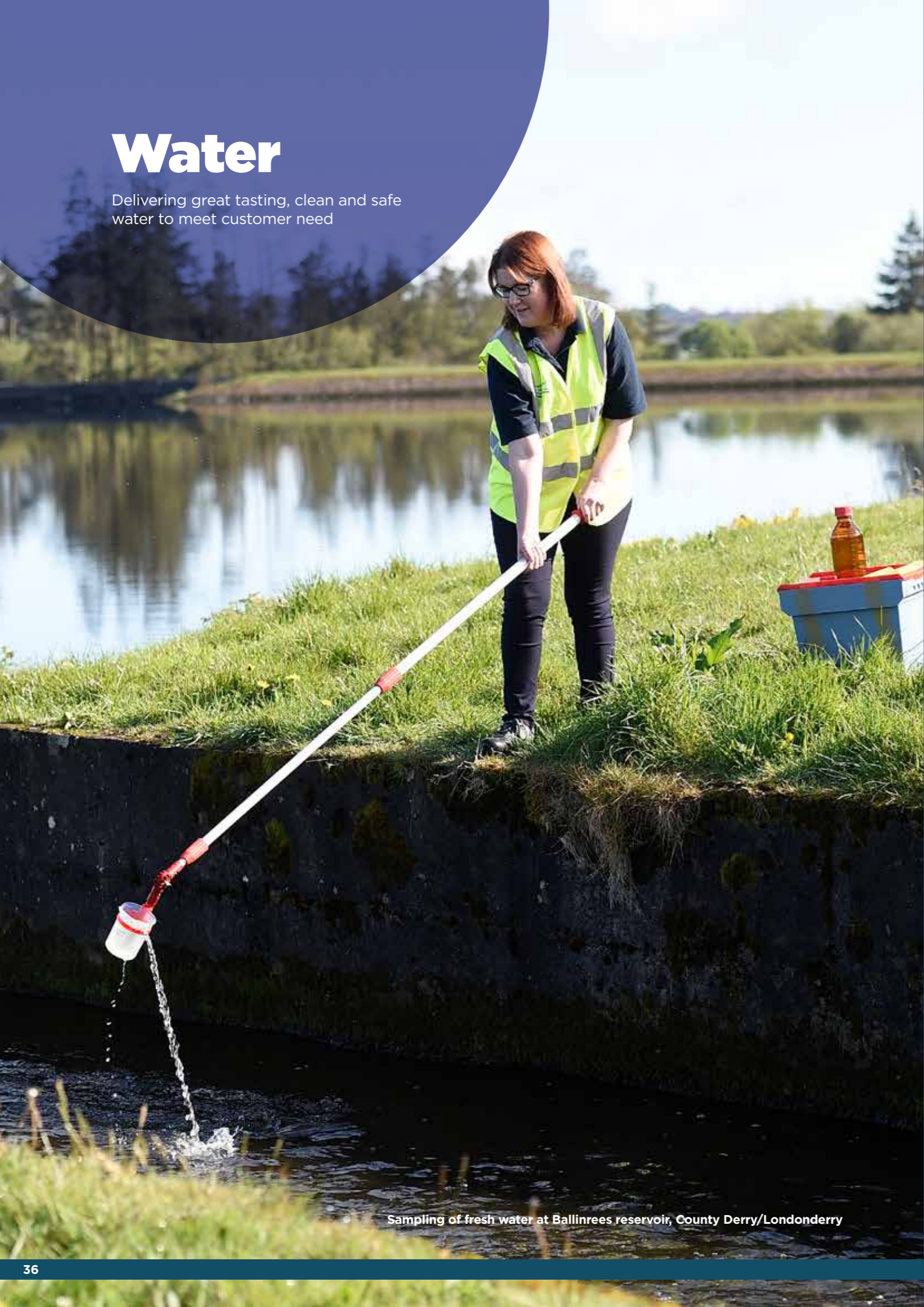


Water

Delivering great tasting, clean and safe water to meet customer need



Sampling of fresh water at Ballinrees reservoir, County Derry/Londonderry

Strategic areas of focus



Sustainable development goals



Principal threats/opportunities

PT1 PT2 PT3 PT4 PT5 PT6 PT7 PO1 PO4

Page 72 Read more about principal threats and opportunities.

Strategic performance indicators

Water	Unit of measurement	Target 2020/21	Actual 2020/21	Pass/Fail	Target 2021/22
Water quality compliance*	%	99.79	99.94	Pass	99.83
Reduction in leakage	Ml/d (Million litres/day)	153.00	157.71	Fail	155.00
Reduction in supply interruptions in excess of:					
• 6 hours		0.792	0.205		0.710
• 12 hours	%	0.146	0.000	Pass	0.130
• 24 hours		0.009	0.000		0.010

*Calendar year target

Strategic areas of focus

Improve at source

NI Water is one of the largest land owners in Northern Ireland. The forests and peat bogs in our water catchments are amongst nature's superstars, providing a range of ecosystem services. They provide a natural form of water purification, protect against floods, help reduce greenhouse gas emissions by removing and storing carbon and enable us to restore our biodiversity.

Since 2017 we have been carrying out an EU INTERREG VA Programme funded investment of €5m under the Source to Tap project to improve the Erne and Derg cross border river catchments that are a source of our drinking water, piloting changes in land management techniques such as fencing to exclude livestock and replacing boom spraying of the herbicide MCPA for rush control, with weed-wipers, which helps to reduce the amount of herbicide running off into our rivers and streams. Over 200 farm

visits have been carried out to identify where improvements can be made to support both the farm business and the water environment through a land incentive scheme pilot. They will pilot initiatives to trial measures to improve water quality by working with land managers and farmers, which will help the project to deliver its objectives of improving freshwater quality. The project officers also work with volunteers and local communities and raise awareness of the importance of protecting our precious drinking water resources. It is hoped these initiatives will help restore nature and improve the water quality before it reaches our treatment works.



Restoring peat bogs - one of nature's superstars

Peatlands store more carbon than all other vegetation types in the world combined. They can improve our water quality, provide natural flood management and support an array of species and provide wild places for people to enjoy. It is crucial for us to restore our natural habitats so they can play their role in the climate emergency and restoring biodiversity.

Peatlands cover 12% of the land area in Northern Ireland. Unfortunately 86% of peatlands have been damaged to make way for farming and construction. As a result, many of our peatlands are net emitters of greenhouse gases. Only about 1% of the peatland area has been restored over the last 30 years.

Peat bogs restoration work under the Source To Tap project in 2020/21 included 30 hectares of formerly afforested land on the Pettigoe Plateau, County Fermanagh. This pilot project involves the conversion of a previous commercial conifer plantation to a functioning bog. The pilot is trialling a technique called cell bunding where low peat embankments are constructed in order to enclose 'cells' of variable shapes and sizes on both high bog and cutover. The aim is to establish peat-forming conditions within each cell by raising the water table within it to support Sphagnum Moss (also known as 'The Bog Builder') development. We will be comparing the recovery of the water table in the bog to other areas where, rather than building cell bunds, only the drains are blocked.

In 2020/21 we commenced a new peatland restoration project on the shores of Lough Bradan, County Tyrone. We are exploring opportunities for EU PEACE PLUS funded catchment projects: the 'IDEALS' Project to build on the Source to Tap project; and Killylane catchment restoration project in County Antrim.



Pilot forest-to-peatland restoration project at Pettigoe Plateau Tullychurry forest, County Fermanagh

Branching out



NI Water takes water from a number of lowland lakes and rivers to supply the wholesome water that we all rely on to drink. It is important for NI Water to protect these areas from bankside erosion and livestock encroachment as much of the water used for our drinking water comes from watercourses. Trees help us to do this. Our 10-year partnership with The Woodland Trust Northern Ireland and other partners has resulted in the planting of over 150,000 trees in some of NI Water's 24 drinking water catchments from Counties Antrim to Armagh. This partnership is helping to restore our forests - Northern Ireland is one of the least wooded regions in Europe, with just 8% woodland cover compared with 13% in the UK and 37% in Europe.

Over 2020/21 NI Water provided resources for a 'wet wood' flood alleviation project alongside the Faughan River, County Derry/Londonderry. Tree species planted together include Alder, Aspen, Sessile Oak, Downy Birch and Willows. The planting of 2,000 trees and creation of ponds within the private land will improve water quality, remove and store carbon, increase biodiversity by providing new havens for wildlife and have wider health and contribute towards societal well-being. Our ambition over the next decade is to plant 1 million of the right trees in the right place. We look forward to our partnership with stakeholders continuing to grow and flourish, just like the trees.



A 'wet wood' flood alleviation project alongside the Faughan River, County Derry/Londonderry. Image provided by Woodland Trust Northern Ireland

Strategic areas of focus

Enough water for all

Our changing climate is bringing more frequent and severe weather events such as heavy rainfall, heatwaves and extreme cold. These events can affect the quality and quantity of our water sources, placing pressure on our water treatment works.



Low water levels at the Silent Valley reservoir, County Down in May 2020

Demand surge and driest Spring on record

Water plays an essential role in the battle against COVID-19 with regular, thorough handwashing and staying hydrated being advised as two of the main ways to fight it. With many people based at home from early April 2020, we saw a significant increase in household water use during periods of warmer weather. Overall average demand has increased by over 10 million litres per day in 2020/21 compared to the previous year.

In parallel with the first lockdown Northern Ireland experienced its driest spring since records begin with a number of impounding reservoirs (store raw water prior to treatment) at their lowest level since 1995. Demand surges were experienced and on 29 May 2020 alone, NI Water had to increase production of treated water by 120 million litres to over 700 million litres to keep everyone supplied, thus increasing pressure on the network and water treatment works.

Water supply was increased to maximum levels and supported by extensive tankering to vulnerable points in the network. To keep customers engaged the media campaign was wide ranging from interactive videos on social media, to TV and radio advertisements. One strand focused on what each person could do to save water and

made saving water sound easy, simple and something we could all achieve. For example, we encouraged everyone to save just 30 litres of water per day with three simple steps. We also developed a live interactive map on our website where a simple click would display where your water comes from and what level the reservoir was sitting at. In addition as part of our Drought Plan, the Drought Order application process was instigated for the first time with a Drought Order implemented for an emergency abstraction to supplement a raw water source. This was despite the impounding reservoirs being full at the start of March 2020. A combination of our response and a period of cooler, wetter weather saw reservoir levels restore from June 2020.



Tankering operations during the high demand event in May 2020

Pumping over £25m into water resilience for the North West, County Down and Belfast

Three key projects totalling £14m are being progressed in the North West to support future resilience of the water supply infrastructure over the next two years. The first project involves the replacement of a 4km water main, which supplies a large rural area outside Coleraine. The second project involving the construction of temporary water pumping stations at Moys in Limavady will help supply additional water from Ballinrees water treatment works in Coleraine to Carmoney water treatment works, which serves the city of Derry/Londonderry. This will increase the capacity of the water supply infrastructure and provide additional resilience, particularly during emergency situations and extreme weather conditions. The third project involves an upgrade to the existing River Faughan raw water pumping Station at Carmoney water treatment works. This will

include replacement of the weir gates to provide extra security and resilience.

Another significant investment is a £13m scheme to improve the security of the water supply at Drumaroad water treatment works, Castlewellan, County Down. This major programme of work will continue until Summer 2021 and involves the construction of a new water storage tank. This treatment works is supplied by water from Silent Valley reservoir and delivers around 140 million litres of water every day to over 200,000 homes in County Down and Belfast. Once complete this will have a positive impact on the lives of up to 540,000 people, a quarter of the Northern Ireland population, who can benefit from increased resilience and security of the water supply, particularly in emergency situations. This will make a real difference to people's daily lives.



New water storage tank under construction at Drumaroad water treatment works, Castlewellan, County Down

Strategic areas of focus

Tasty, clean and safe

Delivery of great tasting, clean and safe drinking water is central to what we do. It underpins the public health and economy of Northern Ireland. The fresh water we use to produce our high quality drinking water is predominantly taken from Lough Neagh, local rivers and a range of upland sources.

Sampling and analysis is carried out 365 days per year to ensure that our drinking water is tasty, clean and safe. Samples are analysed by our scientists based in laboratories at Belfast and Altnagelvin. Overall drinking water quality compliance in 2020 was above the target of 99.79%. COVID-19 has had an impact on regulatory sampling with sample numbers at reduced frequency for all parameters from the end of April to the middle of May 2020. Sampling at customer taps was also suspended, in line with social distancing guidelines, with samples being taken at designated fixed points, service reservoirs (which store treated water) and sampler addresses.

In 2020/21 we trialled a number of pilot studies at Derg water treatment works, County Tyrone, to remove heavy metals, suspended solids (turbidity) and pesticides including using a form of volcanic crushed rock and recycled brown and green glass to filter the water. We are working towards the

delivery of treatment process at Derg water treatment works, Co Tyrone, for herbicide (MCPA) removal to be completed by 31 March 2022.

Meenbog landslide

The pollution incident caused by a peatland landslide in County Donegal in November 2020 had a devastating impact on the Mournebeg River in County Tyrone from which we abstract raw water. It is extremely disappointing for all the stakeholders and the local community who have been working hard to improve and protect the water quality in the area. We had to react quickly to this incident in order to protect customers served by the Derg water treatment works. Resilience measures were activated to ensure that the drinking water supply was not impacted. These measures included taking raw water from the Strule River to feed the Derg water treatment works. The alternative water abstraction arrangements and enhanced monitoring will remain in place until it is safe to recommence abstraction of raw water from the River Derg. NI Water plays a key role in the Inter-Agency group which is aiming to remediation work to restore the Mournebeg and Derg Rivers.



Meenbog peatland landslide in Ballybofey, County Donegal

Real time analysis

In 2020/21 we successfully trialled an innovative mobile testing facility at Derg water treatment works, County Tyrone. This pilot provides real time analysis to inform decision making on the optimal type of capital expenditure at the treatment works. The system has been running in parallel with the existing treatment works, using a number of different processes and technologies to improve how we treat raw water, and will be used across our treatment works to reduce energy, chemicals and carbon while maintaining tasty, clean and safe drinking water for our customers.

We are also planning to increase the amount of monitoring and automated flow control at our water abstraction points across PC21. This increase in data will allow us to more sustainably manage how we abstract raw water from the environment, helping us manage our natural capital. We anticipate that this work will support the need for additional environmental measures to be introduced, such as compensation flows to minimise environmental impact of abstraction and fish passes, help us lower day to day running costs and comply with the Water Framework Directive.



Mobile testing facility

Tackling lead pipes

The water leaving our water treatment works and in the distribution systems contains only trace amounts of lead. However, where lead has been used for supply pipes between the water main and the kitchen tap or in domestic plumbing, there is a risk of non-compliance at the customers' tap. So even with the removal of all lead pipes within our network there will be a risk to lead compliance from lead pipe remaining within customer properties.

consumer properties in addition to lead pipe replacement under water main rehabilitation and in response to sample failures. We plan to replace over 11,000 lead communication pipes in PC21. We are also taking part in an UKWIR project looking at the water chemistry of lead. This project is focused on advancing the water industry's understanding of the chemistry that controls the solubility of lead and how to achieve compliance with the proposed reductions in the lead standard. Find out more about reducing the risk of lead at: www.niwater.com/lead-pipes/

Over the PC15 period, we replaced over 11,000 lead communication pipes at

 https://www.youtube.com/watch?v=9k9FIO_FcZE

Strategic areas of focus

Drive down leakage

Every day we lose around a quarter or 157 million litres of water (over 60 olympic size swimming pools) from our infrastructure. This loss is a combination of leakage through our pipes, which is caused by natural wear and tear, damage from severe weather, leakage on the customer supply pipe, illegal usage or unknown usage. Reducing leakage is a top priority for NI Water, but with a network of around 27,000km of underground water pipes (long enough to circle more than half way around planet earth) located predominately in rural and remote areas, it can be a complex and costly job finding the leaks.

In 2020/21 we reduced leakage by over 3MI/d (over one olympic size swimming pool per day) to 157MI/d. Our leakage teams continued to work around the clock to locate and repair approximately 220 leaks per week. On occasions, this can be very challenging so our highly skilled technicians need to use a variety of leakage detection methods to find the leaks, whether they are on burst water mains or in customer properties. Some of these techniques involve using a listening stick, a tried and tested way of detecting a leak. Another method of detection is using ground microphones.

In 2020/21 we tested a number of initiatives to detect leakage such as acoustic loggers and satellites. Acoustic loggers pinpoint leaks by measuring the noise of escaping water that follows a leak or burst, and then sending an alert together with details of its location, allowing us to focus effort in that area. Satellite technology uses various wavelengths of the visible and invisible light spectrum to locate leaks.

In PC21 we are setting ourselves the challenge of achieving the sustainable economic level of leakage (150MI/d) which is the point at which the cost of fixing a leak outweighs the benefit.


Customers can also help us if they see a leak on the footpath or on the road, from a trickle of water to a gushing burst by letting us know by using our free Leakline number (0800 028 2011) which is open 24 hours a day, every day; visiting www.niwater.com/report-a-leak-or-burst-pipe/; or using the contact details on the back cover of this report. If you spot a leak, we'll find it and fix it. Approximately a quarter of leakage is on customer properties and we would encourage those with a leak on their property to get it fixed quickly. Even a dripping tap can waste more than 60 litres of water a week.



Water leaking from a burst pipe



Repair to a burst pipe

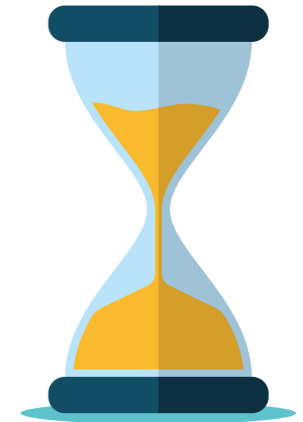
 <https://www.niwater.com/news-detail/11983/our-leakage-team-driving-leakage-down/>

Always on

Every week we repair around 350 customer related bursts that occur on our water network of 27,000km operational distribution and trunk mains. Many of these bursts can result in interruptions to customers' supply or customers experiencing low water pressure.

We have embraced an 'Every minute counts' ethos in response to supply interruptions. We are always looking at ways to improve our performance and are exploring innovative solutions to help us identify problems on our water network before customers are affected.

During 2020/21, we implemented key initiatives such as new planned work procedures and deploying water tankers and laying temporary supplies in order to minimise interruptions during planned and unplanned operations. These initiatives have helped us reduce lost minutes per property for our customers and achieve our supply interruption target for 2020/21. Our PC21 Business Plan includes capital investment to reduce the minutes lost per property by 50%, aiming for zero lost minutes per property by 2050.



every minute counts



NI Water staff repairing supply interruptions



Filling tankers during the high demand event in May 2020