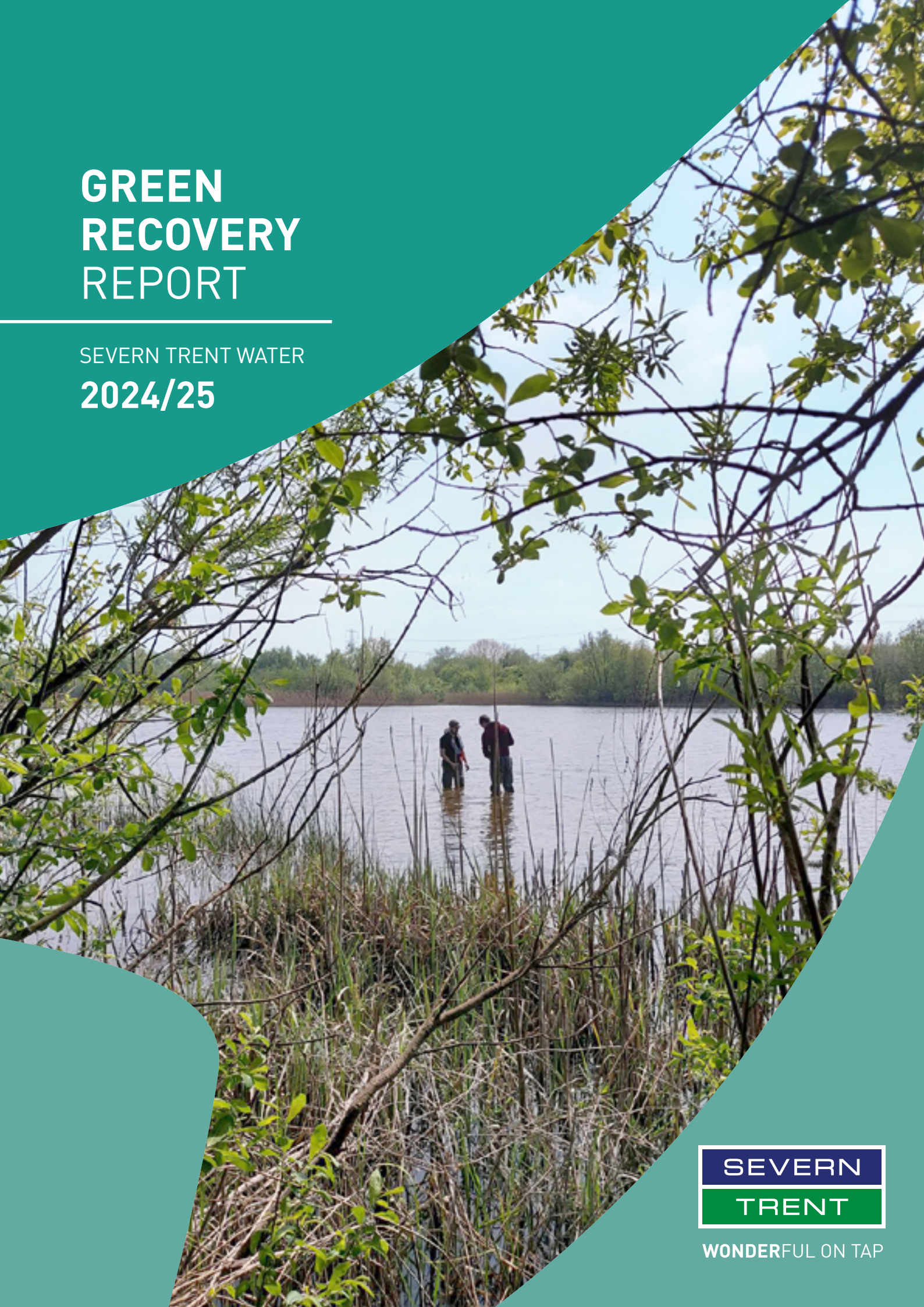
GREEN RECOVERY REPORT

SEVERN TRENT WATER

2024/25



SEVERN TRENT

WONDERFUL ON TAP

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INTRODUCTION
FROM OUR CEO

Almost five years ago the country was emerging from the COVID-19 pandemic. Water companies were challenged to play their part in building back greener; addressing some of the economic and social issues faced, while delivering lasting environmental improvements.
We responded by proposing six projects under our ambitious Green Recovery programme and were awarded £566 million (2017/18 prices) by Ofwat – 71% of all funding awarded to the sector. I am delighted to introduce our final Green Recovery Report, setting out our path to final delivery over the last 12 months and highlighting the benefits these innovative projects deliver to our customers, communities and the environment.

Over the course of all six projects, we have gained invaluable insights—delivering critical improvements at pace, in a sustainable and collaborative way. Alongside this, we have built significant experience in emerging areas, including future expectations around Per and Polyfluroalkyl Substances ('PFAS'), often referred to as 'forever chemicals'.

As our Green Recovery programme draws to a close, I believe it's essential to share the lessons we have learned. Over the past year, we have made excellent progress across each project. This report offers a transparent assessment of our achievements over the programme, the challenges we have faced, and the wide range of deliverables and benefits delivered. We hope this information proves valuable to all our stakeholders—particularly to other companies in our sector embarking on similar journeys—and that, ultimately, all customers will benefit from the pioneering work Severn Trent has led under Green Recovery.

Innovation has been a defining theme throughout our Green Recovery programme, giving us the opportunity to develop and test new ways of working, often using cutting-edge technology to work on novel approaches to the challenges facing all water companies. We will be seeing the impact of this genuinely ground-breaking work for decades to come and I am incredibly proud of the role we have taken in driving these innovations forward.

Since the start of our Green Recovery programme:

£594.5 million
has been invested across our programme

157,329
smart meters have been installed

31,156 m³
storage created in SuDS features

17,176
homes had supply pipes upgraded at no cost to the householder

93 Ml/d
water treatment works built capable of treating 93 Ml/d of additional water supply

Lower water consumption


Faster environmental improvements


Rivers safe for swimming


Protecting customer supply pipes


Creating sustainable flood resilient communities


More water for more customers

Among the many highlights across the programme, one that stand outs for me has been our work in developing sustainable, flood-resilient communities. We have essentially 're-plumbed' the drainage for an entire town – the first time anyone in the UK has worked on Sustainable urban Drainage Solutions ('SuDS') at this scale. As a result, we have cut the risk of surface water flooding for more than 90,000 people in Mansfield, with more than 31 million litres of additional rainwater storage across the town, that would fill more than 12 Olympic swimming pools. We will be applying this approach in other areas in AMP8 and beyond.

Effective communication with local communities makes the difference between good and brilliant when it comes to bringing projects like these to life. By telling our story – clearly, openly and enthusiastically – we have been able to bring these transformational projects to life and maximise their positive impact. And by working together, we can better understand customer and community priorities, gaining feedback to help shape what we do for them today, and over the years to come.

I am particularly impressed by the work we have done to engage with local and national representatives, such as Councillors and MPs, to share our vision for the areas we all serve. We all want to drive improvement for the places where we live, and it is encouraging to see us all working together. In a similar vein, our constructive relationship with regulators, including Ofwat, the Drinking Water Inspectorate ('DWI') and the Environment Agency ('EA') continues, and we have valued their feedback throughout the programme.

The water industry as a whole shares many common challenges, which is why we are committed to sharing what we have learned through our Green Recovery programme. I think it is only right that we share our knowledge, for the benefit of all customers and the wider environment. Over the past year alone, we have held and attended a number of knowledge sharing sessions on a variety of topics including technical innovation, ways of working, supply chain partners and customer engagement. As our Green Recovery work concludes, this engagement will form a useful model for future collaboration across the sector.

Whether it is preserving water supplies for future generations, protecting customers from the impact of climate change, reducing our impact on the environment, or promoting healthy rivers, our work will have a lasting positive impact. Our programme is making a massive difference in our communities, whilst also creating hundreds of employment opportunities and building specialist technical skills in our region and beyond.

The lessons we have learned since 2021 will stay with us for decades—equipping us to tackle shared challenges across the sector with greater insight, resilience, and collaboration. Our purpose of 'taking care of one of life's essentials' is our focus every day and I am grateful for how committed each and every Severn Trenter, particularly our Green Recovery team, has been to our Green Recovery programme since 2021. You have helped us to support our customers, communities and the environment - making a lasting impact for generations to come.

Liv Garfield
CEO

OUR GREEN RECOVERY **PROGRAMME**

Our strategy to be 'performance driven, sustainability led' acknowledges our relentless drive to deliver the performance that our stakeholders expect, in a sustainable way.

Our Green Recovery programme consists of six innovative projects, five of which were delivered by 31 March 2025. Our Accelerating Environmental Improvement project will, as planned, continue until 2027. Our Green Recovery programme was designed to update our water networks, improve our region as a place to live and work, and find new ways to serve and benefit our customers, both now and in the long term.

Each project was carefully selected to address real, pressing issues that our customers told us matter most to them—such as improving river health, managing the impact of population growth and tackling the challenges of climate change.

Long-term sustainable benefits of Green Recovery

- Improving the environment and enhancing nature for our communities, so we and future generations can enjoy the places where we live;
- Reducing the amount of water lost through leaks;
- Helping customers understand their water usage;
- Delivering improvements to river water quality;
- Helping communities to become more flood resilient;
- Protecting customer health and wellbeing; and
- Creating jobs and opportunities for people in the places where they live.

The six innovative projects under our programme are as follows:

Lower water consumption

We have installed tens of thousands of smart water meters across Coventry and Warwickshire. As well as helping ensure more of our water gets to where it is needed, they help our customers learn about and manage their water use. Smart meters also help us to spot leaks, understand demand patterns and respond and plan more effectively. Our work over AMP7 has provided a blueprint for our smart water meter installations in AMP8, which has been shared with the broader sector.

Protecting customer supply pipes

Many homes in the UK still rely on old supply pipes that are more likely to leak. These pipes are sometimes made from lead and / or jointly shared with neighbours. We have replaced thousands of customer-owned supply pipes, at no cost to households, in two areas; one urban (Coventry) and one semi-rural (Bomere Heath in Shropshire) to ensure more reliable water, for generations to come.

Faster environmental improvements

This project has implemented innovative approaches, using new ways of working, to realise benefits to the environment sooner.

We have been improving the health of 500 km of rivers in our region, some five years earlier than planned, through our £113 million investment in wastewater treatment sites, improving the quality of water we return to the environment. This meant delivering our Water Industry National Environment Programme ('WINEP') one whole AMP cycle sooner. With two more years of innovation still ahead before the programme concludes in 2027, we are already ahead of target—demonstrating strong momentum and a clear path to lasting impact.

Creating sustainable flood resilient communities

Climate change, population growth and urban development places homes and businesses at risk from surface water flooding. In our largest project to date, we installed SuDS capable of storing millions of litres of water, across Mansfield. These interventions use a range of natural solutions to capture, slow, store and filter rainwater - as well as delivering improved biodiversity and creating places for local people to enjoy.

Rivers safe for swimming

Since the beginning of our Green Recovery programme in 2021, rivers – and work to improve their water quality - have gained even greater national attention. We have invested £70 million as part of our Green Recovery Bathing project to improve the water quality along more than 50 km of rivers throughout Warwickshire and Shropshire and have helped to move two stretches - on the Rivers Leam and Teme - towards bathing quality.

More water for more customers

We are committed to ensuring that our customers continue to have a supply of water they can rely on, both now and for future generations. Climate change and population growth puts pressure on water supplies and our newest treatment works at Witches Oak in the East Midlands will supply enough water every day for a city the size of Derby.

We are using traditional engineering techniques alongside more innovative, environmentally-friendly and sustainable ways of treating and supplying water for our customers. Creating new floating wetlands means we are using natural water filters to clean and care for our customers water – in a sustainable way, reducing our carbon impact, meaning we need to use fewer chemicals to treat and clean it too.

We have also worked with thousands of businesses to understand their water usage, helping them to become more sustainable, save water and reduce their bills.

CUSTOMER BENEFITS OF OUR **GREEN RECOVERY PROGRAMME**

Lower water consumption

Supporting customers to understand their water usage and reduce where possible.

Using smart meters to identify leaks to preserve water supplies and reduce the potential for leaks to cause damage.

How we are doing it

- Installing more than 157,000 smart meters for customers, on top of our base meter installation target.
- Giving customers timely access to their usage data, alerting them to potential leaks and sharing hints and tips to reduce their usage.

What this looks like

- Around 9 Ml/d lower water consumption, due to more efficient use and reduced leaks.
- Helping customers to save money on their water bills.
- Raising awareness of the environmental impact and carbon footprint of water usage and undetected leakage.
- Improving data capture and having a better understanding of our water balance.

Protecting customer supply pipes

Helping customers to replace old, leaking and lead-based supply pipes.

Preserving supplies from customer-side leaks and protecting customers from the potentially harmful effects of lead in drinking water.

How we are doing it

- Replacing customer supply pipes in two very different areas (urban and semi-rural) for thousands of customers – at no cost to them.
- Testing different models of delivery – direct labour, contract labour and grant model – to find the most efficient methods and inform future planning.

What this looks like

- Reduced risk of leaks from customer pipes, saving thousands of litres of water per day.
- Simplified supply pipes with old joint supply pipes replaced with individual supplies.
- Reducing the need for chemical dosing to protect customers from lead (in Bomere Heath).

Faster environmental improvements

Improving the environment more quickly – delivering Water Framework Directive ('WFD') outcomes five years ahead of our target.

How we are doing it

- Reducing spills from combined sewer overflows ('CSOs') to protect rivers from the impact of storms.
- Using the latest technology and innovative methods to treat wastewater to the highest quality possible.
- Monitoring river water quality and sharing this data publicly.
- Accelerated CSO interventions and enhanced site investigations.

What this looks like

- Improving over 500 km of river.
- Supporting aquatic wildlife to thrive.
- Improving river health and not being the reason that our rivers do not achieve good status.

Rivers safe for swimming

Improving water quality along more than 50 km of rivers throughout Warwickshire and Shropshire, and moving two stretches (on the Rivers Leam and Teme) towards bathing river quality.

How we are doing it

- Using ozone technology for wastewater treatment – a first in the UK – improving the UK's river water quality and our understanding of micropollutants such as pharmaceuticals and their environmental impact.
- Increasing our network resilience by adding more storm water storage and implementing long-term solutions that remove surface water from our network to increase our capacity.

What this looks like

- The rivers are a better place to be for everyone, no matter how they use them, providing future riverside amenity opportunities.
- Provides a blueprint for improving more rivers in the future, supporting and growing river-based economies and providing new community well-being and enjoyment opportunities.
- Improved biodiversity across river-based habitats, for land-based and aquatic species.

Creating sustainable flood resilient communities

Helping the urban area of Mansfield to become more flood resilient.

Reducing the impact of rainfall on our current sewerage network.

How we are doing it

- In the largest UK programme to date, we are installing SuDS such as rain gardens, detention basins and bioswales. Creating a greener, cleaner environment across urban and suburban sites.
- Reducing more than 31,000 m^3 of storage requirement from our traditional sewers in the local area.

What this looks like

- Up to 90,000 of our customers will have a much lower risk of flooding with lower carbon solutions.
- Creating biodiverse-rich habitat.

More water for more customers

Helping to secure water supplies for the future, using new technology and nature based approaches.

How we are doing it

- Using floating wetlands to treat water, with 31 new wetlands across our Witches Oak site.
- A brand-new water treatment works where we will be fully treating and cleaning water ready for drinking, using sustainable, low-carbon processes.
- Helping local schools and businesses save water by offering free water efficiency checks.

What this looks like

- Additional water supply of 93 Ml/d, to provide resilience against climate change and population growth both now and for the benefit of future generations.
- Improved biodiversity with up to 23 hectares of habitat enhanced.
- Improved knowledge on low carbon water treatment – shared with others in our sector to help the UK understand how to bring new capacity into supply.

GREEN RECOVERY ACHIEVEMENTS

What has inspired me most - and filled me with immense pride - is our incredible people and teams. Their unwavering determination to overcome challenges across every single project has been nothing short of extraordinary. Time and again, they have stepped up to deliver solutions that have never been attempted before, often at an unprecedented scale. Their commitment, creativity, and resilience have been the driving force behind everything we have achieved. It was more than three and half years ago that we were awarded Green Recovery funding by Ofwat and I am incredibly proud of what we have achieved over that time – including innovation, learning and knowledge sharing - both internally and across the wider sector.

Chris Wand,
Head of Green Recovery

Faster Environmental Improvements

21 WFD points delivered

2 storm water treatment trials delivered

54 infrastructure enhancements implemented to strengthen network resilience and improve system performance

25 pairs of river monitors installed

31,156 m³ new natural storage capacity for surface water

7 different types of SuDS features retrofitted

11,365 m² of permeable paving delivered

84 urban streetscape features delivered (raingardens, tree pits and verge gardens and street planters)

155 nature-based SuDS features delivered (bioswales and detention basins)

Creating Sustainable Flood Resilient Communities

Lower Water Consumption

66,319 smart meters installed in unmetered homes

91,010 meters replaced with new smart meters

3.4 Ml/d leakage saved

9.0 Ml/d PCC Saved

Rivers Safe for Swimming

3 ozone treatment units installed

12 storm water tanks installed

7.3 ha of impermeable surfaces disconnected from combined sewers - separating rainwater from sewers

>120 km river improved

5,914 livestock tested

17,176 customer supply pipes replaced

11,652 joint supply pipes separated

12 plumbing firms benefitted from supply replacement work

8 contractors delivered supply pipe replacement work

Protecting Customer Supply Pipes

1 brand new water treatment works built using innovative granular activated carbon filters

1 pilot plant delivered, providing real-time analysis

1 mobile pumping station built

31 floating reedbeds naturally treating raw water

3,000 non-household audits carried out to reduce business consumption

More Water for More Customers

JOB CREATION FROM OUR **GREEN RECOVERY PROGRAMME**

In addition to the benefits delivered for customers and the environment, our Green Recovery programme has also created a wide range of job opportunities across our region. We welcomed many new team members, and our supply chain partners also played a significant role in job creation, contributing even more employment opportunities.

Our programme also created many indirect employment opportunities in the communities we serve, such as providing work for plumbers in Coventry, contracting designers and engineers in Mansfield, engaging river officers to advocate for river protection, and establishing new supply chains for river quality monitoring systems.

We prioritised using local companies to enhance regional skills and expertise, ensuring long-term benefits for our region. It was essential that our project teams reflected the diversity of our communities and so we embraced a variety of backgrounds, experiences, and perspectives, making significant progress towards a workforce that mirrors the communities we serve.

Our commitment to nurturing new talent was evident through the support we have provided to our graduates, apprentices, and interns. Through placements within the programme, many have gained valuable hands-on experience, helping them grow both professionally and personally, and equipping them with lifelong skills.

Our focus on employee engagement has allowed us to attract and retain talent, and to continue to motivate our teams. Our employee engagement survey results for our Green Recovery Team members remained among the top 2% of utility companies worldwide.

Job Creation

319
people directly recruited

19.4%
of those recruited are from a minority ethnic background

40.4%
of those recruited were female

9.5
score out of 10 in our annual employee engagement survey

I have thoroughly enjoyed my apprenticeship with Severn Trent and have been pushed far out of my comfort zone while learning and applying new knowledge in a full time role. It has been quite demanding and fast paced at times, but I have learnt an incredible amount about maintaining the water network and other aspects of the business. I hope to continue at Severn Trent after my apprenticeship in a full time role to develop my skillset further.

Amarbir Kalirai
Apprentice

I have learnt so much about the water industry - what it takes to supply our customers with water and making sure they stay on that supply without interruptions. I have been able to enhance different skills during my apprenticeship - this has given me more confidence when doing tasks and in turn, being able to do it faster and more efficiently. I have been supported through every step on my apprenticeship and made some good friends along the way, it has been great so far and looking forward to continuing my career within Severn Trent.

Will Felton
Apprentice

During my time in Green Recovery, I have had the valuable opportunity to contribute across three distinct teams: PMO, Smart Metering and Bathing Rivers. This cross-functional experience has not only broadened my understanding of the programme's strategic and operational goals but has also strengthened my project management and problem-solving skills. I have had lots of exciting opportunities in Green Recovery, including presenting to external stakeholders such as the Environment Agency and our external auditors, as well as filming a YouTube video to promote our Ozone projects.

Isabella Beaumont
Assistant Project Manager

During my apprenticeship with Severn Trent, I have gained hands-on experience in the water industry, learning important skills to help keep water flowing to communities. I have worked on projects alongside experienced professionals, building my confidence, problem-solving, and teamwork skills. I have also made great friends and had a lot of support. I am excited to take everything I have learned into my new role within Severn Trent and continue growing in my career.

Jack McDermott
Apprentice

My apprenticeship with Severn Trent has been fantastic and insightful, learning everything there is to know about the clean water side of the business. It has been challenging at times with the amount of training and work that I have had to put in but it has been really enjoyable and I am looking forward to being qualified and building my career with Severn Trent.

James Wallace
Apprentice

Working on the Green Recovery programme has been very exciting, working on projects that can make a real difference to the environment and the communities we live in makes me very proud! It has been very challenging at times but I've learnt so much during my time on the programme and am looking forward to learning even more! I've even had a Tunnel Boring Machine named after me!

Laura Greaves
Assistant Project Manager

BUILDING SUSTAINABLE **FLOOD RESILIENT COMMUNITIES**

Using nature to reduce the risk of flooding

More of us are living in towns and cities, and this is likely to continue with increases in population. Paired with the ongoing challenges of climate change such as extreme weather patterns and increases in flooding, this leads to more challenges when it comes to dealing with rainwater – in order to protect homes and businesses from flooding and reduce the impact on sewerage systems.

SuDS use natural methods to slow down and soak up rainwater, protecting and enhancing local communities. Our SuDS project in Mansfield, the UK's biggest project of its kind, has delivered 31,156 m^3 of new storage capacity since 2022, while giving us a wealth of learning on building these solutions at scale, especially in existing urban and suburban environments. As we—and others—expand the use of SuDS in more locations, the lessons learned will prove invaluable in shaping smarter, more resilient solutions for the future.

Urban streetscapes

We understand how devastating the impact of flooding to homes and businesses can be, particularly in built-up areas, which is why we are committed to ensuring we have solutions in place that work in an urban environment. These include fully-built solutions such as permeable paving and rain gardens, alongside additions to existing buildings like downpipe planters.

Verge and street rain gardens

One of the most effective SuDS interventions we have deployed are verge and street rain gardens. Constructed on the roadside and in areas with little or no green spaces, these provide an efficient solution to intercept and retain surface water in storm events.

We have built 83 rain gardens across Mansfield, providing nearly one million litres of additional surface water storage 947 m^3.

Rainwater downpipe planters

We worked with the Mining Remediation Authority and the University of Sheffield, installing four rainwater downpipe planters ('RDPs') on their site in Mansfield, to capture and slow down rainwater from rooftops.

We have also installed nine RDPs at Asquith School in Mansfield as a trial of working with one supplier, adapting their RDP to capture and attenuate increased volume.

We are using these exercises to compare the various planters available, and the lessons will help us throughout AMP8 when we consider RDPs within future plans.

2,898 m^3 storage delivered in permeable paving

Permeable paving

In the right areas, permeable paving can have a significant impact. Across Mansfield we have installed 11,365 m^2 of permeable paving, with a combined storage capacity of 2,898 m^3.

As a result of this project, we have developed a new permeable paving standard, accepted by the Nottingham County Council Highway's Authority and Housing Authority for future installation.

947 m^3 storage delivered in rain gardens

What we have learnt about urban streetscapes

While we have been successful at installing SuDS in urban streetscapes, this has not been without its challenges – all of which have helped to shape and inform our future plans to make them more effective.

Verge and street gardens, for instance, while effective at intercepting surface water, are relatively expensive solutions for the amount of water they can store. We also found there was considerable resistance to them from local residents in some areas due to the loss of verge parking and we found that customers are often not in favour of solutions which do not directly benefit them, even though they would contribute to a reduction in surface water flooding downstream. Permeable paving is quite expensive, especially when used in relatively small bespoke areas and it is important to install it in the right place. Areas with a slope – even the minor camber of a road – are not suitable as water runs off rather than soaking into the paving. The new permeable paving standard we developed includes catchment area and gradient limitations, which will be used for all future permeable paving opportunities to determine effectiveness prior to installation.

A change to our plans

We agreed our Green Recovery plans for the Mansfield project with Ofwat, to provide a range of different types of intervention across the town. Originally we agreed that no single type of intervention would be responsible for 70% or more of the total water storage capacity.

The lessons we learned from the project showed us that urban interventions like the ones on this page, while useful, come with affordability and acceptability challenges. To meet the 'no more than 70%' rule would either have meant reducing the overall impact of the scheme or increasing the cost. Neither of these outcomes would have been beneficial to residents and customers.

Following engagement with Ofwat, the remainder of the project concentrated on nature-based solutions, outlined on the following pages, which makes up around 88% of the total water storage capacity. These provide better value for money and have the added benefit of being even more environmentally friendly and enhancing the amenity of local areas.

Nature-based solutions

Alongside the retro-fitted SuDS solutions used in more urban streetscapes, nature-based solutions such as detention basins and bioswales complete the picture for the Mansfield project.

We have had particular success with these types of intervention, being able to deliver water storage at large scale, with minimal long-term disruption to local residents.

Detention basins

Detention basins are depressions that are dug into the landscape. They act as temporary storage tanks for rainwater, diverting the flow of surface water and preventing downstream flooding, before gradually releasing it to soak into the ground. They have many benefits for the local area:

- **Flow control** - they slow down rainwater, releasing it slowly to reduce the risk of flooding and prevent overwhelming our drainage systems. As well as reducing the frequency and volume of storm overflow spills.
- **Improve water quality** - they help to filter out dirt and pollutants, keeping our water cleaner.
- **Biodiversity boost** - detention basins help to create mini-ecosystems for birds and other wildlife. Native plants thrive in these basins, too.
- **Easy and cost-effective to install** – we have been focusing more on detention basins, and less on roadside interventions (which cost more and cause more disruption than we would like for our customers).

Oak Tree Estate – Magpies Park detention basin

This location was a regular flood risk area, affecting a high number of Mansfield District Council housing stock and residents.

Our work has diverted surface water that was entering the sewerage system – causing flooding after extreme weather - to a brand new natural storage facility, that can hold 3.4 million litres, reducing flood risk and alleviating the impact and frequency of events.

Newcastle Street detention basin

To enable this transformation, Secretary of State approval was secured for the change of use from designated allotment land to a sustainable drainage asset. As part of the scheme, four new 250 m² allotment plots were reinstated for community use, enhancing local engagement and green space.

The scheme also delivers a significant environmental benefit, providing over 693,000 litres of additional stormwater storage capacity to help manage surface water sustainably.

12,542 m³ storage delivered in detention basins

Delivering detention basins to Mansfield

Each detention basin needs a bespoke design to make the best use of the size and shape of the space. However, by having standard design principles we have been able to replicate elements of each design more easily and faster.

Over the period of the Mansfield project we have installed 12 large detention basins in the area, capable of storing 12,542 m³ of rainwater between them.

Delamere Drive detention basin

This 1970s and 80s housing development was built with a separate surface water system which was connected to the combined sewer and the area had known flooding issues upstream on the estate.

A new detention basin on Spider Park will now hold more than 1.5 million litres of surface water in storm conditions. We expect most of it will soak away naturally, and we will closely monitor any surplus that might need to return to the main sewer.

Oak Tree Estate - Melbourne detention basin

This is a great example of working with the local community to provide additional utility for residents.

As well as building more than 875,000 litres of additional surface water storage, we worked with Friends of Oak Tree to provide a new football pitch using soil from the excavation.

Bioswales

In some ways similar to detention basins, bioswales are typically engineered channels with gently sloping slides, often built alongside roads. A bioswale takes away stormwater runoff and guides it along a route, allowing it to soak naturally into the ground, or in some cases drain slowly into a sewer. As the water travels, native plants help to filter it, taking out pollutants.

Delivering bioswales to Mansfield

Bioswales have been a major success in Mansfield, providing significant stormwater storage capacity by making effective use of available land next to or away from roadways. They are relatively easy to construct and can easily be 'retro-fitted' where space is available. Another advantage is that we have been able to build them in areas where there was little to no negative impact on local residents' daily lives in the long-term. Bioswales can be costlier than detention basins as we have to build return drainage in some places, and they do not deliver the same scale of storage. As with detention basins, constraints can include the availability of suitable land and the size and shape of the area, together with highway design and road safety. We have delivered 143 bioswales, delivering 14,761 m^3 of storage in total.

14,761 m^3 storage delivered in bioswales

Non-household greening

We worked with local businesses to pilot a scheme offering SuDS with the incentive of a reduction in their surface water wholesale tariff.

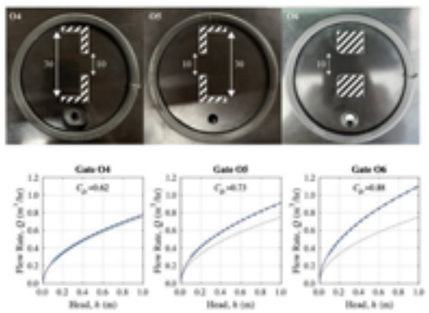
A range of interventions were offered, with verge rain gardens, street planters, bioswales or detention basins built by Severn Trent, with ownership of asset and land retained by the business. This gives landowners the benefit of the asset with long-term maintenance liability to Severn Trent.

We found some of the larger sites, such as supermarkets and other retailers, to be more challenging due to their concerns about potential disruption. Government buildings, and organisations with whom we had an existing relationship were easier. An example of this is the Mining Remediation Authority headquarters in Mansfield, where we were able to build seven areas of permeable paving, five bioswales, and four downpipe planters, preventing 652,000 litres of rainwater from entering the sewer during a storm event.

Monitoring and evaluation

It was essential to evaluate the performance of these interventions—not only to make real-time improvements during implementation, but also to inform and enhance the design of future projects. Funding academic partnerships meant we could run several monitoring and evaluation activities, including:

- Designing hydraulic performance monitoring programmes to ensure useful data capture at the device and catchment scales.
- Deploying of sensing equipment at 26 solutions, representing around 8% of installations and capturing all solution types apart from tree pits.
- Compared actual performance to hydraulic model predictions.
- Laboratory investigations into sensing equipment, intervention flow control chambers, SuDS aggregates and growing media.



Innovation

Working at such a scale on SuDS was in itself an innovative approach, helping us plan for future projects and inform other parties across the UK and beyond. We were able to use this opportunity to trial several other new approaches to the design, build and delivery of SuDS solutions in Mansfield:

- **Slimline design/Plug and Play** – using 'off the shelf' standard components allowed us and our contractors to take a modular approach to several interventions, including rain gardens, downpipe planters and bioswales.
- **Faster and cheaper** – working with local bodies such as the Local Authority and Highways Agency, we were able to identify 180 'forgotten' and abandoned spaces across the area as candidates for interventions. Of these, 120 were considered, with further investigation giving us detailed designs for 76 interventions, some 30% faster than the equivalent process earlier in the project.
- **Further 'cherry-picking'** – gave us a range of interventions delivered in just five months, for a benefit of around 1.6 million litres extra storage.

Value - cost per m^3

Ultimately our aim was to build interventions that will collect the maximum amount of surface water, to protect customers and communities form flooding and reduce the impact on our sewerage network.

Each type of SuDS intervention has its own benefits and challenges, and building them at scale in Mansfield meant that we could closely measure these, using this information to inform future plans. Centrally funded, large schemes such as this project in Mansfield are expensive and becoming increasingly difficult to deliver due to additional costs like Biodiversity Net Gain ('BNG') requirements.

In April 2024, it became a legal requirement for new developments in England requiring planning permission to deliver at least a 10% BNG. This requirement, introduced under the Environment Act 2021, applies to all but a few exempt developments.

Out of the 12 Designated Basins ('DB') or similar drainage features we built as part of this project, 10 were approved before the BNG rules came into effect. The remaining two had to meet the new BNG requirements, which involved additional work. Meeting the BNG requirements increased costs by approximately £30,000 and triggered a 6–8 week delay, which was a 20% extension to the project timeline. Future projects may face similar or greater impacts.

To comply with BNG rules, a legal agreement (Unilateral Undertaking) was needed with the landowner (Mansfield District Council) to guarantee 30 years of habitat management, as required by law. Six of the other 10 DBs, two would have required additional spend and time to achieve 10%. Even among the 10 DBs approved before the rules, two would not have met the 10% BNG threshold without extra investment and time, highlighting the challenge of retrofitting compliance. BNG legislation includes "trading rules" that restrict how biodiversity units can be substituted (e.g., you cannot easily swap trees for wildflower meadows). However, existing grassland is often acceptable and easier to work with.

Looking ahead to AMP8, there is a risk that other planning authorities may require planning permission for bioswales, which would then trigger BNG requirements. Mansfield District Council only applied this to the Managed Flood Risk project, which meant unit costs for this project were higher than originally expected. As the project has progressed we have been able to reduce the costs per intervention through improved processes and using our learnings to make the right choice of intervention in the right location (and equally when and where not to create certain interventions).

Our project learnings have enabled us to calculate the following 'Cost per m^3 metric' for each type of intervention:

Green Communities

Sustainable drainage and water management features provide wider benefits to customers than traditional drainage solutions including improved water quality and biodiversity as well as providing more attractive landscapes.

The amount of natural and social capital value that the company creates for local communities through the construction of sustainable drainage and water management features is reported in Severn Trent Water's Green Communities ODI. We have used a simplified version of the CIRIA natural and social capital tool called B£ST to create our B£ST Lite tool, to interpret how much natural and social capital value has been created through the delivery of the Green Recovery SuDS features in Mansfield. We believe that these interventions have generated over £14 million worth of natural and social capital value by improving the natural value of the areas people live and work in.

Intervention type	Cost per m^3 (£)*
Detention Basins	621.13
Bioswales	2,801.08
Verge Rain Gardens	10,563.01
Street Rain Gardens	12,938.02
Tree Pit	6,178.51
Permeable Paving	4,630.68

*using business case estimated volume

Awards and recognition

The Environment Agency hosts the Flood and Coast Excellence Awards annually, which celebrate the most innovative and impactful flood and coastal erosion risk management projects from across the country.

We are delighted that the Mansfield Sustainable Flood Resilience Programme won the '2024 Climate Resilient Built Environment' award which recognises projects or programmes in the built environment that have achieved excellent resilience to flood and coastal change alongside their primary aim.

Research, partnership and knowledge sharing

We are working with the University of Liverpool and the University of Sheffield, co-funding the 'EUGINE: Enhancing Urban Green Infrastructure via Knowledge Exchange' research project. This has permitted Dr. Simon De-Ville (Lecturer in Water and Environmental Engineering) to be embedded within the project team since January 2023.

We secured follow-on funding to recruit a PhD student to continue the data collection and analysis beyond March 2025, contributing toward a four-year research project.

The objectives of this research project are:

- To maintain the monitoring project for a period of at least two years to capture the hydraulic response of interventions to a variety of rainfall events. This includes intensive investigation at the Mining Remediation Authority campus.
- To analyse and interpret monitoring data and report on intervention performance compared with design expectations.
- To inform the development of drainage models and design tools to help optimise future retrofit projects.
- To evaluate the various intervention types and the hydraulic benefit they provide in relation to construction costs.

To date our partnerships have resulted in two academic outputs:

- Presentation of Bioretention Inlet Testing work (conducted in partnership with Arup) at the 'International Conference on Urban Drainage' in Delft, June 2024. This work has also been submitted to CIWEM's Journal of Flood Risk Management and is currently undergoing peer review.
- The publication of a Briefing Document in the Proceedings of the Institution of Civil Engineers ('ICE'): 'De-Ville, S., Wilson, F., and Stovin, V. (2024) Briefing: How long-term monitoring of SuDS will inform next-generation guidance and modelling tools. Proceedings of the ICE - Civil Engineering.'

Surface water flooding reduction is a wider collective challenge and we all have a part to play. Whilst Severn Trent is committed to supporting this, we have identified and understand that more parties need to get involved, therefore this has led to the creation of our new Flooding Community Officer roles to educate, signpost and advise our customers and other community stakeholders. We are working to mitigate climate change impact through investment but other factors contributing to surface water flooding, such as paving over front gardens and verges and development, need support from others.

Additional third-party funding

We originally expected to obtain funding from other sources to cover 11% of our total project costs – around £9.35 million, but this has proved extremely challenging to realise. Local Authorities are facing significant financial constraints which mean that few are able to make significant capital commitments. Despite these challenges, we were delighted to have received contributions from:

- The Environment Agency has contributed £95,000 so far under their Water Environment Improvement Fund and we are seeking a further £3.2 million Flood Defence Grant in Aid from the Environment Agency.
- Nottinghamshire County Council contributed £350,000 flood partnership capital funding.
- Mansfield District Council Town Hall partnership site contribution £104,347.
- We secured £65,265 PhD funding from Sheffield University and £91,072 from EPSRC Research Council funding.
- We also secured dozens of other contributions to our interventions across Mansfield.
- In addition, we avoided spending to the sum of £1.9 million forecast as a result of gift-in-kind support.

TAKING CARE OF **SUPPLY PIPES**

Replacing lead supply pipes in Coventry and Bomere Heath

If your home was built before 1970 it might still have a supply pipe, connecting you to our network, that is made of lead. Some of these pipes may be leaking or even shared with neighbours.

Our supply pipes trial project sought to replace thousands of customer supply pipes, at no direct cost to the customer, in two very different environments – urban (Coventry) and semi-rural (Bomere Heath in Shropshire).

We are delighted to have completed this project, replacing 17,176 customer supply pipes - providing safe water supplies for thousands of households for decades to come.

The project has also given us extensive experience in managing different delivery models and we have been able to share this learning with other water companies across the UK, benefiting the future of lead pipe management.

Delivery models

With thousands of individual tasks to deliver in a relatively short timeframe, we were able to generate wider economic benefits—supporting local supply chains and creating opportunities within the communities we serve.

Grant model

The Grant model allows customers to choose a WaterSafe or Water Industry Approved Products and Services ('WIAPS') approved plumber on the open market to complete their private-side and internal work on the supply pipe upgrade. We then provide a grant to the plumber for their work. The Grant Scheme also allowed homeowners to have the lead replacement work as an option if they were having other internal works completed for example a new kitchen or bathroom.

This is the most cost-efficient model, with maximum customer choice, and is our recommendation to other water companies, especially if they are running a similar project company-wide.

We initially also ran an 'in house' model, however the grant model became so successful we moved to fully support this model, rather than completing any end-to-end work in-house.

We created a website to support the process, which gave customers the option to choose a service more 'bespoke' to their needs, often with a plumber with whom they already had a strong relationship. It was a great way of supporting local businesses and we ultimately had 12 firms signed up.

The Grant model works really well to remove lead supply pipes across wide areas, with many independent operatives offering great options and choices to customers. It also means there is no need to ring-fence company crews to deliver the highways element as these could be incorporated within crews already in the area.

3,489 supply pipes replaced on the grant scheme

17,176 customer supply pipes replaced

Contractor model

This model approves contractors to support our project, assigning given areas for them to work in. The contractors engage with potential customers, securing registrations and sign-ups. They handle customer liaison, traffic management, scheduling, backfill of excavation and reinstatement.

By the end of the trial, we had eight contractors providing upgrades for customers across our area.

Contractor work includes public communication pipe, private customer supply pipe and internal pipework replacement. Severn Trent involvement occurs at the end, where we gain, and listen to, customer feedback. This is a competitive model, where we can allocate areas to specific contractors. It works well in completing lead removal in quantity in discrete areas.

The contractor model helps to provide employment opportunities in our region, building skills and expertise capability for the future. It allows different-sized firms to take part and is a fast route to market enabling us to deliver improvements to customers quickly.

We have gathered the following insights on building a contractor model;

- It takes **time for suppliers to upskill** at scale to replace to the compliance point.
- **Standardised communications** enable better control of messaging with contractors.
- Work with local **housing associations** for additional sign up.
- **Supply chain engagement sessions** enable sharing of best practice between contractors.
- Maintain **active engagement** with local authorities – to manage disruption for residents and councils.
- Additional resource needed for **quality checks and auditing** – we also found this could be conducted at same time as GIS mapping.
- **Advance planning of rollout** is needed for seamless transition of contractors to new areas.
- Design of an **App for contractors to upload evidence onsite** and offline makes more effective auditing and ensures consistency across the project.

Scaling up and lessons learnt

This initiative has not only provided wider employment opportunities within our communities but also significantly contributed to the local economy. We offered plumbers £1,300 for a full private side relay and internal plumbing work where lead was found, and £500 for leak repairs. This has resulted in the substantial investment of £4,524,500 in the plumbing sector alone. This investment has been particularly positively impactful for smaller plumbing businesses.

Establishing the grant model presented some early challenges, and considerable effort was required to engage plumbers and bring them on board. This process took time and should not be underestimated—it was a critical step in ensuring the programme's success. This ultimately impacted our ability to deliver the maximum benefit within the timescales of the project. By the final year we were running at an average of 25.2 replacements per day (including weekends and bank holidays), whereas in 2022/23, 18 months into the project we were averaging 3.9 jobs per day.

As plumbers are free to trade where they want, we cannot assign specific areas to individuals, and therefore the grant model may not entirely remove lead out of whole areas in the same way that contractors would (by heavily targeting an area). To source skilled tradespeople for the grant model, we attended the Installer Show at the NEC, offered in-house Water Mark qualifications for free, and utilised social media and word-of-mouth referrals. This proactive approach ensured we attracted and retained top talent.

Initially, we trialled using our direct labour teams for both highway and private/internal work. However, we quickly realised that we could leverage the expertise of plumbers for private side and internal work, to enable our direct teams to focus on highway work. This strategic shift optimised service deliver for customers and enhanced project efficiency.

735 supply pipes replaced directly by Severn Trent operatives

The flexibility of the Grant model has allowed us to operate across our region, beyond the District Metered Areas assigned to our contractors. This adaptability enabled us to benefit from economies of scale, particularly in relation to traffic management and excavation costs. By setting up once and using the same pit or trench for multiple jobs, we significantly reduced our expenses. While larger contractors may find it inefficient to handle smaller jobs, the Grant model works exceptionally well for smaller businesses, providing them with consistent work and growth opportunities.

If we were to undertake this work again, we would offer the Grant model alongside any others, as it offers customers choice and flexibility in terms of location, ensuring that we can meet their needs effectively and efficiently. However, we would consider implementing rules around this model to prevent plumbers from cherry picking the easier work.

Using our existing company Lead and Shared Policy, our technical team managed the front end process and lead proof investigation using virtual techniques such as video calling to avoid the need for additional expensive on-site visits. The team then raised the work with our scheduling team who coordinated the plumber and the Severn Trent team to attend on the same day. This enabled us to scale up without having to replicate in house teams.

Our Green Recovery Grant model has not only driven economic growth and job creation but also fostered a collaborative and efficient approach to managing our water infrastructure projects. This model stands as a testament to our commitment to innovation, sustainability, and community support.

70 supply pipes replaced in Bomere Heath

Focus on Bomere Heath

Bomere Heath is a small town in rural Shropshire which gets its water supply from a single groundwater source, which we dose with phosphate to protect customers from lead (see 'Phosphate removal' section below).

We chose to test the supply pipe upgrade project here as it is our smallest single source control group and a 100% replacement rate would mean we could switch off the phosphate dosing, leading to significant environmental, operational and financial benefits.

We originally believed that there would be a high incidence of lead, as most properties in the town date from a time when lead was common in connections. However, after carrying out extensive sampling, we found less lead pipes than we expected – less than 20% of properties were affected. As Bomere Heath is a relatively affluent area, customers may have opted to remove lead pipes privately in the past.

We have supported customers by replacing lead pipes where we have confirmed they exist and have replaced lead in internal plumbing fittings too. We have helped remove the risk of lead from 70 properties in the town.

We are proud to be leading the way with a trailblazing phosphorus disengagement plan. This initiative has received positive feedback from the DWI, who have expressed their support and confidence in our approach. We are now in the final stages of enacting the disengagement, marking a significant milestone in sustainable water quality management.

Our comprehensive plan includes a robust monitoring schedule following the cessation of phosphorus dosing, ensuring continued oversight of water quality. We are also agreeing a tailored customer engagement strategy for the small number of customers who have declined in-home water quality sampling, with contingency measures in place should property ownership change.

To maintain system stability and ensure flexibility, the dosing plant will remain operational for at least one year post-disengagement, providing a safeguard should reactivation be required. In parallel, advanced water chemistry modelling will support the assessment and management of any potential impacts throughout the transition. This project sets a new standard for innovation in the sector and reinforces our commitment to environmental stewardship and regulatory excellence.

Phosphate removal

Like many other water companies, we add phosphates (typically phosphorus) to drinking water to help protect consumers from the effects of lead used in plumbing.

Phosphates help to prevent metal leaching from pipes, leading to safer water quality. However, phosphates can be harmful to river quality so to prevent this we currently have to take them out again in the wastewater treatment process. This requires energy and increases our carbon impact. Additionally, phosphorus is mined overseas and transported to the UK in bulk. Reducing dosing would therefore be a significant benefit. If we can remove all of the lead plumbing from an area getting its water supply from a single source, we can stop phosphate dosing.

We are working closely with the Drinking Water Inspectorate ('DWI') to develop a comprehensive phosphorus disengagement plan. This includes an ongoing monitoring schedule following the cessation of phosphorus dosing, ensuring continued oversight of water quality. Additionally, we are implementing a tailored customer engagement strategy for the few customers who have declined water quality sampling in their homes, with provisions for monitoring in the event of property ownership changes.

Water Sampling

To fully understand the potential lead in supply, we sought to look at all 1,406 properties in and around Bomere Heath in detail.

Using our own team, we aimed to sample the water at every property taking its supply from the local borehole to enable all lead to be removed from customer supply pipes. Next steps for each sampled property were:

- no further action needed, which was around 35%, because it was confirmed to have no lead;
- immediate work needed, which was on less than 2%, because lead was confirmed on the supply; or
- further surveys and trial holes to determine whether lead was present on around 65%.

Of this final group, most were subsequently found to be free from lead, but around 5% were confirmed to need further work, showing the benefits of this two-stage process.

Challenging cases

Whilst carrying out lead pipe removal work we encountered were some particularly challenging properties, including:

- A large well-established house fed by 450 m of ¼ inch lead pipe, running through managed parkland, past two Grade 2 listed walls.
- A property with a high lead reading at the kitchen tap, calling for replacement of 330 m of pipe for the property and its neighbour – subsequent investigations proved this was down to internal plumbing, with external pipes being plastic.
- A house built in 2015 with high sample results, eventually shown to be down to lead solder used in internal plumbing, which we replaced. We have shared this case study with the DWI and other regulators.

Customer Engagement

As we were aiming to remove all lead from the pipes and houses around Bomere Heath up to the kitchen tap, engagement with the community was vital. Bomere Heath has a high proportion of vulnerable customers, partially due to the older demographic. It was important to spend time and effort to engage with people in the area, to explain what we were doing and held build trust. Over the last few years we have offered a range of communication methods including; communicating planned time slots, out of hours visits, letters and calls. We wanted to go further to make sure the local community knew why we were there and were happy to sign up so we recruited a dedicated Customer Experience specialist to hold coffee mornings and produce extensive physical and digital marketing. We also held bi-weekly meetings with Shropshire Council to keep them up to date.

We offered financial support to the much-loved Bomere Heath coffee shop, helping keep it open in the face of imminent closure in 2023. We also supported the Shropshire verges project, organised litter collections, and even replaced the weathered village bench – a natural gathering spot overlooking the village – with a fresh one.

To keep us, and our contractors focused on the customer experience we:

- Increased customer audits and implemented additional audits;
- Introduced additional customer comms to ensure our customers were informed at each step;
- Implemented a clear process when a goodwill gesture is offered to ensure consistency and cost savings;
- Required a supervisor sign off form to be completed and signed by the customer and a 'post site walk' undertaken at the end of every experience;
- Introduced a 12-month warranty card to be transparent with our customers;
- Produced a live customer dashboard for all contractors to view their performance, which included a leadership board; and
- Spent time with other areas and other utility companies to share best practice and key learnings.

Industry sharing

Lead supply pipes are not solely a problem for Severn Trent customers, so we were keen to share our experience with other water companies. We held a Lead Industry Day in October 2024, bringing together around 90 attendees from water companies, trade bodies and regulators to talk about the issue.

This was an opportunity for us to talk about the challenges and lessons we had learned, enabling us to share our insight into the various delivery models. We also commissioned our own customer research and were able to provide useful information to other companies considering their own projects.

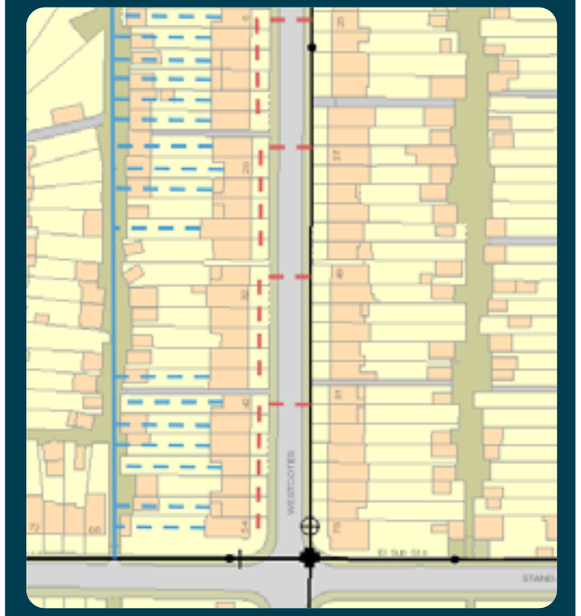
Feedback from attendees included:

- "My particular highlight was the presentation from the Severn Trent team. The dedication and enthusiasm of the team was clear to see, and it demonstrates that it is possible to tackle the issue of lead pipes. I think there is plenty that the industry and Government can learn from this."
- "The shared challenges and open discussions on tacking the issue. The renewed energy that it has given us."
- "I liked how well attended the event was and the discussions it prompted. It is clear that there are plenty of people in the industry that want to do the best by customers and get rid of lead."

Mains renewal

While our focus was on upgrading individual supply pipes, the project also allowed us to renew mains pipes in several locations because it provided the best and most efficient solution for our customers.

We laid three new mains in Coventry, on Eastcote, Middlecotes and Westcotes. We were able to simplify installations by running the pipes from the back of the property straight into the kitchen, rather than running the supply pipes around properties and across neighbours' gardens where it would be disruptive and could add complications in the event future building works took place.



Key

- Water main
- Original private lead services
- New services
- New main

Meter installations and splitting supplies

In addition to lead removal, our supply pipes project has supported the installation of smart meters. In particular, we have been able to add meters where we are splitting supplies (i.e. removing shared supplies and giving each home its own supply pipe). This means we have been able to add new external meters when the only alternative would have been an internal meter and only then if there were space for it. Removing joint supplies also benefits customers by removing issues if there are any leaks on a joint supply pipe in the future.

Installing a new boundary box at each property means we can put a meter outside every home, which we can read externally without needing access to the property. It also means each customer has their own isolation valve so it would not affect neighbours if their supply needed to be switched off due to a leak or maintenance.

Social housing

A major boost to the project came through our collaboration with social housing providers. In Coventry alone, more than 14,000 properties fall into this category. One of the city's largest providers, Citizen, played a key role—granting us permission to carry out work across all their properties, actively promoting the scheme to residents, and establishing a data-sharing agreement that allowed us to contact tenants directly to arrange installations.

Given that social housing often includes a higher proportion of vulnerable customers, being able to deliver these no-cost improvements quickly and efficiently was a significant benefit for everyone involved.

1,951 supply pipes replaced on housing association properties

Asset mapping

The project has also provided the unexpected benefit by allowing us to update records of our assets and in many cases customer assets too.

We have collected information on the connecting ferrules, boundary boxes and points of entry for the vast majority of our works, within 1-10 cm of accuracy. As well as giving customers a much better view of their service pipes, it will undoubtedly help us in the years to come when it comes to maintenance, digging and reinstatement.

Citizen has worked closely with Severn Trent to replace lead water pipes across our properties. Through regular communication and collaboration, our teams have shared expertise and resources, delivering effective, sustainable solutions for our communities. It has been a pleasure to work with Severn Trent and we hope to work together once more on future schemes.

Paul Kerby, Citizen Housing

Insights from the supply pipes replacement project

Our Supply Pipes project has been delivered successfully, supported by extensive customer engagement and innovative working practices, and we have enhanced service delivery ensuring the effective replacement of lead pipes.

Community engagement and awareness

A cornerstone of our approach has been direct engagement with communities. More than 50 local events were hosted to encourage customer participation, supported by the distribution of over 10,000 welcome packs. Social media campaigns and face-to-face interactions proved to be the most effective methods for driving customer uptake, highlighting the importance of personal connection in public outreach.

Customer uptake and response

Our inspections revealed that 25% of properties engaging with us had no lead. Of the inspections conducted, 56% successfully led to pipe replacements. Notably, customers responded more positively to messaging around "upgrading" their pipes rather than the health implications of removing lead, underscoring the need for effective, and clear, communication in similar initiatives.

Operational efficiencies and innovations

We implemented a street-by-street approach, which significantly improved working efficiencies and streamlined project execution. New technologies such as micro cameras were deployed to eliminate unnecessary trial holes, reducing disruption while maintaining precision in pipe assessments. Additionally, road closures were optimised by waiting for at least three lead-affected properties to sign up before requesting closures, minimising repeated excavations and disturbances.

Infrastructure improvements

Throughout the project, we completed 17,176 supply pipe replacements, achieving an impressive first-time customer satisfaction rate of over 98% in 2024/25. The project also involved substantial infrastructure enhancements, including more than 3,100 supply pipe build overs and over 100 external wall insulations. Further analysis showed that 75% of installations involved joint supply pipes, demonstrating the complexity of multi-property connections within our network.

The role of timing and community leadership

A crucial lesson from this initiative has been the influence of community leaders in improving customer engagement. Their involvement helped build trust and increase sign-ups among residents. Additionally, customer response surged towards the latter stages of the project, when the scheme became a time-limited offer, reinforcing the impact of urgency in driving participation.

Enhancing customer experience

Our focus on customer communication was maintained throughout, through clear communication at every step of their journey. Providing regular updates and guidance throughout the replacement process led to increased confidence and trust from our customers. The proactive engagement model adopted in this project sets a strong precedent for future infrastructure projects requiring public participation.

LOWER WATER **CONSUMPTION**

Installing smart meters for thousands of customers

Helping our customers to understand and manage their water consumption through the roll out of smart meters is a key part of our plans to reduce water consumption in our region. This project is now complete and has seen us install 157,329 smart meters across Coventry and Warwickshire.

Smart meters play an important role in water distribution:

- **Detecting leaks:** smart meters spot abnormal water flows quickly, allowing us to tackle leaks. Ultimately this means more water gets to where it is needed, from homes and businesses to schools and hospitals.
- **Putting customers in charge:** allowing householders to understand their usage and spot problems like leaks or internal plumbing issues quickly. Plus, they can realise the positive impact they are making; reduced water use means lower energy consumption and fewer greenhouse gas emissions.
- **Adaptive demand management:** by giving us a view of water usage throughout the day, smart meters help us to plan and manage demand, so everyone gets water when they need it.
- **Smart data:** this ambitious project spurred us on to create a data network spanning Coventry and Warwickshire. We can now gather and analyse data in real-time, remotely and efficiently.

Smart meter installations

We have installed 66,319 new smart meters and exchanged 91,010 existing 'non-smart' ones, for smart meters, bringing our total smart meter installations to 157,329.

In this final year of the project we have been dealing with more of the challenging installations, which has helped us to learn a number of lessons to take into future smart metering projects.

Complex cases

Jobs can be complex due to traffic management needs, where we are digging in and around roads, along with parking and access issues. We established safe practices through collaborating and thinking innovatively - this could be as straightforward as using wheelbarrows to overcome access-related issues or parking further away with conditioned permits. Where we found resident parking that was an issue, sending letters asking residents for help also proved effective.

Digs on private property

Often we need to dig on a customer's driveway as this is where the existing stop tap is located. To do this, we need customers' agreement and this can be at times be challenging. We spoke to customers to understand the best way to raise this and developed new ways of approaching this conversation, incorporating customers' feedback. At the same time, we worked to reduce the number of cases where we need to do this, by tracing the supply pipe back to the public side so we could work on the footpath instead.

157,329 smart meters installed

Internal metering

In some cases we knew we needed to install meters inside a customer's property. Often this could be because the property shares a joint supply with neighbours – another reason why removing joint supplies under the supply pipe project helps.

Internal installations bring their own challenges, as the customer needs to agree to this and grant access for the work. We need to organise a specific appointment time and date for the installer to fit the meter if the pipework and space is available. For these cases, we have created bespoke invitations addressed to the billpayer, concentrating on the benefits to them and encouraging them to make contact. Inviting these customers to apply led to 113 new internal smart meter installations.

Boundary boxes

A delaying factor on installations in the past has been the condition of existing boundary boxes. Where the box is filled with debris we have often had to dig to replace it with a new one, increasing the time spent on each job. However, we have found that using an innovative approach to jetwash affected boundary boxes has transformed delivery of these jobs, making it easier for us to house a new meter or replace the existing one.

Pipe materials – galvanise steel

When installing meters we are often faced with a range of existing plumbing materials onto which we need to fit the new equipment. A particular problem is with galvanised steel pipework, which can be prone to failure after we have been digging it around it, due to material corrosion, which could cause leaks and damage in the future.

Given the issues this can cause to large scale projects like this, we spent time developing new safety measures and processes – such as 'low spark' cutting blades, to allow us to work effectively in places where galvanised steel has been used.

As a result we have been able to install more than 3,000 meters where we might not otherwise have been able to do so.

Communications

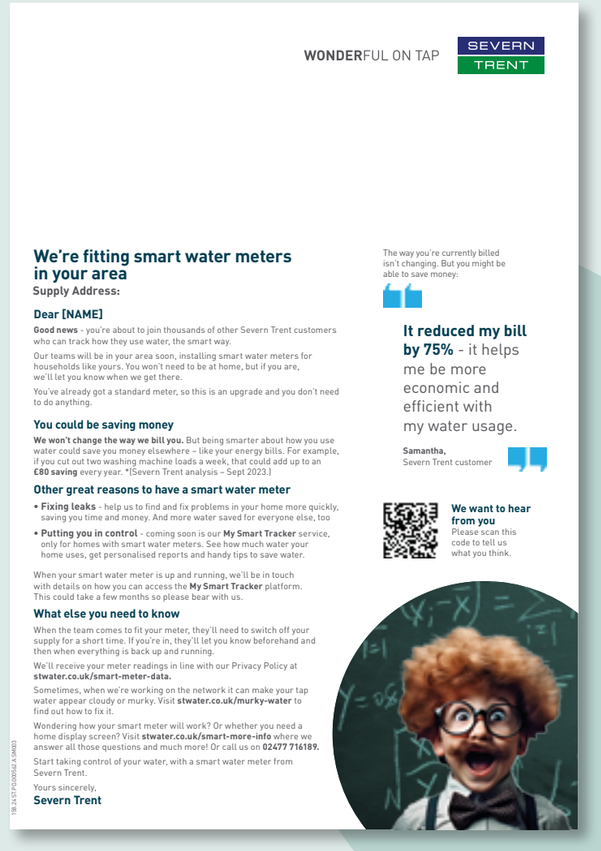
To enhance the customer journey, we introduced a new visual identity to the smart metering project. This included revised communication materials, such as installation letters, which were more concise and addressed key customer concerns in line with their feedback, for example, bill changes and water quality. This new visual identity helped the project become more engaging and easily identifiable for our customers.

Upgrading existing meters

Given the number of existing 'non-smart' meters in use across our network, anything we can do to improve the process of upgrading these is going to help with the overall adoption of smart metering.

In some areas we have trialled the use of a new type of technology, Diehl Premium Gateway, that acts as a smart meter 'add-on' to an existing setup. This removes the need for us to install entire new meters, the technology remotely sending secure readings to us.

Another issue can simply be with the placement of the existing meter. If it is too deep, a smart meter may not work as it can't make a strong connection to the local wireless network. So we successfully trialled the use of 'risers' to bring the new meter closer to the surface, giving us more cases where we could install smart technology.



WONDERFUL ON TAP

SEVERN TRENT

We're fitting smart water meters in your area

Supply Address:

Dear [NAME]

Good news - you're about to join thousands of other Severn Trent customers who can track how they use water, the smart way.

Our teams will be in your area soon, installing smart water meters for households like yours. You won't need to be at home, but if you are, we'll let you know when we get there.

You've already got a standard meter, so this is an upgrade and you don't need to do anything.

You could be saving money

We won't change the way we bill you. But being smarter about how you use water could save you money elsewhere – like your energy bills. For example, if you cut out two washing machine loads a week, that could add up to an **£80 saving** every year. *[Severn Trent analysis – Sept 2023.]

Other great reasons to have a smart water meter

- **Fixing leaks** - help us to find and fix problems in your home more quickly, saving you time and money. And more water saved for everyone else, too
- **Putting you in control** - coming soon is our **My Smart Tracker** service, only for homes with smart water meters. See how much water your home uses, get personalised reports and handy tips to save water.

When your smart water meter is up and running, we'll be in touch with details on how you can access the **My Smart Tracker** platform. This could take a few months so please bear with us.

What else you need to know

When the team comes to fit your meter, they'll need to switch off your supply for a short time. If you're in, they'll let you know beforehand and then when everything is back up and running.

We'll receive your meter readings in line with our Privacy Policy at **stwater.co.uk/smart-meter-data.**

Sometimes, when we're working on the network it can make your tap water appear cloudy or murky. Visit **stwater.co.uk/murky-water** to find out how to fix it.

Wondering how your smart meter will work? Or whether you need a home display screen? Visit **stwater.co.uk/smart-more-info** where we answer all those questions and much more! Or call us on **02477 716189.**

Start taking control of your water, with a smart water meter from Severn Trent.

Yours sincerely,
Severn Trent

The way you're currently billed isn't changing. But you might be able to save money:

It reduced my bill by 75% - it helps me be more economic and efficient with my water usage.

Samantha,
Severn Trent customer

We want to hear from you
Please scan this code to tell us what you think.

Surveying

We carried out reviews of areas already surveyed, and by utilising some of the new ways of working described here, we found almost 4,000 new installation opportunities to fit smart meters where these had previously been deemed 'too difficult'.

Leakage and consumption reduction

Smart meters play a vital role in identifying water waste in homes. Small issues like constantly running toilets or dripping taps can have a large cumulative effect.
Our customers play an important role in helping us detect these problems early. Thanks to smart meter installation and real-time monitoring, both we and our customers can quickly identify unusual water usage—especially when no flow is expected.

Since its launch, more than 61,000 customers are actively using our 'My Smart Tracker' platform, seamlessly integrated with their smart meters. This tool has enhanced how our customers interact with us. Within the last year we have delivered over 527,000 communications—including monthly usage summaries and alerts about potential leaks. Through listening to customers' feedback, we recognised over 60% of our customers ranked 'financials' being the number one driver for reducing their consumption. As a result, we have also released new features online, which includes cost of consumption, an integrated leakage alerts journey and a 'switch button' which enables our unmeasured customers swiftly switch to measured billing.

We have developed a process to help customers who we think might have a leak, which we have been able to identify through a higher than expected flow rate. Typically, we will send up to four Leak Alerts to a potential affected customer over an 80 day period, each one offering help and guidance. We are pleased to report that in over 80% of cases where a meter reading has triggered a leak alert, the continuous flow has subsequently stopped.

For larger (30-100 litres per hour continuous flows) we enlist the services of a third party via our Water Efficiency Team. Customers are contacted and offered a free Home Water Efficiency Check, during which leaks are found, fixed (where possible) and the customer receives an educational chat about saving water around the home. Over the last three years, 639 customers have received a Home Water Efficiency Check and we repaired 192 leaks at no charge to the customer.

During AMP8 we will further enhance this process, with a Customer Inspector from our Customer Leakage Support Team visiting customers where the continuous flow is still happening after the fourth Alert. These visits will help to find and fix more leaks.

Over the last year we have started including Priority Service Register ('PSR') customers in this Leak Alert process. We managed this slowly, with those customers likely to feel most distress added last so we could learn more about messaging before contacting them. By November 2025, all PSR customers with smart meters will go through the Leak Alert process.

Another win for us has been making it easier for landlords and managing agents to deal with leaks. This change was triggered when a landlord called asking for help as he had several properties and did not know which one was showing a continuous flow. Adding a supply address has led to continuous flows being fixed on average 11 days faster than before, for rental properties.

At the completion of this project in March 2025, we are pleased to be saving over 12 million litres a day for leakage and PCC reduction, across the areas covered by our Green Recovery programme.

3.4 Ml/d leakage saving

9 Ml/d reduced consumption

Online platform

Our online platform 'Smart Tracker' for smart metering has proven to be invaluable, playing a crucial role in facilitating benefits for Per Capita Consumption ('PCC') and leakage reduction. As we move into AMP8, it is crucial to recognise not only these advantages but also the affordability benefits for customers, giving them the tools to better manage their bills. Building on this functionality will be essential for continued success in AMP8 and beyond.

Smart district metered areas

The true value of smart metering becomes clear when the majority of properties in an area are connected—unlocking more accurate data, faster leak detection, and better water management for both customers and the network. We have a smart District Metered Area ('DMA') in Leamington Spa which has 92% smart meter coverage. We have a 15 minute nightline on all meters in this DMA, which means they send us readings every quarter of an hour, 24/7. Having this level of connection at DMA level gives us a much better understanding of usage versus leakage, helping with planning and repairs.

We have also installed a smart DMA meter on this network, so we can see exactly what enters the area and where it leaves. This gives us valuable insight with a fully balanced picture of the area. This has been installed alongside the radio meter and logger which allows for a full comparison to be completed.

A further new development is the creation of a smart DMA concept. We have built a DMA rig and will input genuine smart meter-enabled properties in an area to create a virtual smart area, giving us the benefits of smart meters in geographical areas where smart meter penetration is not yet as prolific.

Connectivity and coverage

A cornerstone of our smart metering project has been establishing robust, real-time connectivity across our meter fleet. Over the last year, we have significantly expanded our communications infrastructure, installing a network of data gateways that now enable over 128,000 customer meters to transmit daily readings across Coventry and Warwickshire. This near real time data flow is critical to improving operational responsiveness, leakage detection, and customer engagement.

In more rural or complex environments, connectivity has posed greater challenges. To overcome these, we have deployed a range of innovative solutions. For example, risers - highlighted in the 'Upgrading existing meters' section on page 39, have proven effective in elevating meters closer to ground level, improving signal strength in areas where underground installations struggle to connect. Trials have shown that even meters previously reporting 0% connectivity achieved 100% performance post-riser installation.

We have also enhanced our asset data collection, enabling us to analyse long-term trends and proactively address connectivity issues. This includes mapping every boundary box and understanding the materials and environmental conditions that affect signal quality. Our field technicians, supported by additional gateway installations, have played a vital role in rapidly identifying and resolving issues - both in urban and rural settings.

We explored the use of the Diehl Premium Gateway to upgrade existing Automatic Meter Reading ('AMR') meters to Advanced Metering Infrastructure ('AMI') functionality. This approach allowed us to extend the life of current assets - avoiding unnecessary write-offs - while unlocking the benefits of smart metering, including; real-time data, improved leakage detection, and operational efficiencies. A small-scale trial was conducted on over 900 properties in Rugby area of Warwickshire and presented a favourable saving of £68,000 for resource time to install and asset costs. This trial offered a valuable opportunity to enhance existing AMR meters with smart functionality, and provided important insights into where this approach is most effective. It highlighted both the potential and the practical considerations, such as infrastructure needs and deployment complexity, that will help guide our future strategy. These learnings are now shaping how we assess upgrade options across our network, ensuring we make informed, value-driven decisions as we continue to expand our smart metering capability.

This project has not only delivered tangible benefits for customers and the network—it has also positioned us as the sector leaders in smart meter connectivity. Through the deployment of innovative technologies and strategic infrastructure planning, we have built a deep understanding of what it takes to deliver reliable, scalable smart metering at pace.

The insights we have gained - particularly around connectivity, performance, and installation best practices - are already shaping our approach to AMP8. They are helping us refine our rollout strategy, prioritise investment where it will have the greatest impact, and ensure our infrastructure continues to evolve to meet the needs of our customers, our region, and the wider industry in the years ahead.

Data management

The new smart meters we have installed across Coventry and Warwickshire provide us with over 3 million datapoints every day. Effective and secure processing of this information is vital, so we have expanded our data management and maintenance practices to accommodate the sheer volume of data we are now generating daily - we have learned lessons on data accuracy, dealing with latency issues, and system integrity. Some of our activity has involved creating efficient data pipelines, optimising refresh timings, removing obsolete processes while enhancing those that extract and transform data.

We now have a much-improved ability to handle the increasing volume of data while maintaining the integrity of our data systems. Importantly, we can now leverage smart data to drive meaningful insights in water management. Is it an ongoing process which will maximise the benefits of smart metering, leading to a more sustainable and efficient water network.

Community engagement – 'Hard to Reach' campaign

Throughout the project, but particularly in the later years, we were faced with customers who were initially reluctant to have a smart meter installed. The reasons fall into a number of categories, such as: billing concerns, digs and reinstatements, data security, worries about harmful radiation and a wariness of smart technology.

We wanted to give people the opportunity to learn about smart meters and their benefits in an open and honest way. We made changes to our recruitment campaign materials to address some of these concerns and we ran a number of face-to-face events so we could speak to customer directly. We held seven community engagement events in areas where we had encountered most resistance to smart meters, using local social media groups and influential members of the communities to promote the events. These were a mix of formal presentations and informal drop-ins, depending on audience and venue.

With a range of promotional assets, including multilingual leaflets, translators, and water-saving device giveaways, we saw local individuals attending to learn more about the reality of smart meters, at the same time as being able to talk about other related issues with their water supply.

When holding face-to-face events in the community, we have learned it is best to provide Water Saving Devices and leaflets that customers can take away to drive interest and interaction as well as providing a reminder of the conversations. Explaining what a shower timer is will lead naturally into a water saving conversation, and then on to a discussion of the benefits of smart metering.

Knowledge sharing

Smart water metering is the future for all water companies and their customers in the UK. As a leading installer of smart meters, it is only right that we should seek to pass on our learnings and share knowledge with the rest of the industry.

Industry groups

We actively engage with all water companies across England and Wales, and in the last year this has included attending the annual Smart Water Systems conference and collaborating on Smart Metering Advisory Group calls.

Through the Advisory Group we have been able to get industry-wide agreement on:

- Capturing hourly usage data as standard for household customers;
- Capturing 15-minute data between 2.00am and 5.00am to improve our understanding of nightline data; and
- Understanding and reviewing procurement opportunities for meters to ensure the supply chain can meet the increased demand.

As a leader in smart metering, we have also been working closely with Ofwat to align on Price Control Deliverable requirements for the industry, engaging with them to discuss at the Draft Determination stage.

Individual company engagement

Over the course of the project, we have had many individual sessions to talk around network connectivity with Anglian Water, Thames Water, Yorkshire Water, Northumbrian Water, South West Water, Jersey Water, Affinity Water, Welsh Water, United Utilities, Irish Water and Portsmouth Water.

We have explored a range of topics including:

- how to store and manage the large datasets;
- leak threshold levels; and
- non-household 15-minute data collection.

Innovation partnerships

Working with Yorkshire Water and Northumbrian Water has led to a better understanding of various technologies such as LoRaWAN, Connexin and Netmore. Through our collaborations with other water companies, we were able to identify the opportunities to install 'Risers' (referenced in sections 'Upgrading existing meters' and 'Connectivity and coverage'). In addition to this, we have also explored the use of 'extenders' via our partnership with Connexin. 'Extenders' clip onto the radio unit, and a wire is fixed onto the boundary box lid to improve connectivity. We are exploring how improved processes and clearer communication can enhance outcomes for meter exchanges and internal installations.

Through collaboration with other water companies including Yorkshire Water, Thames Water, and Affinity Water, we have identified common challenges, such as inaccessible internal stop taps, poor internal pipework conditions, and limited customer availability. To address these, we launched our 'proactive new internal' journey in September 2024. This includes asking customers to provide more information upfront, including photos of their internal stop tap, so we can triage issues earlier and improve the success rate of internal installations.

Insights and data

As part of Water UK, we are actively collaborating with other water companies to consolidate insights and share learnings from our smart metering projects. This collective effort is helping to build a clearer picture of what is working well and where challenges remain. By pooling our experiences, we aim to identify opportunities for continuous improvement, ensuring that each new phase of smart metering delivers more efficient, customer-focused, and future-ready outcomes for the industry. Our shared ambition is to drive innovation and consistency across the sector, ultimately supporting better regulatory alignment and long-term value for customers.

Non-household ('NHH') customers

Through the successes of our smart metering project, we identified opportunities for demand management with our NHH customers and have successfully initiated the rollout of smart meters through both proactive and reactive approaches. Funded through accelerated AMP8 spend, our proactive deployment commenced in Coventry and Warwickshire, leveraging the existing connectivity infrastructure implemented through our Green Recovery smart metering project.

In collaboration with an organisation called Cross 8, we are working on initiatives for AMI NHH customers. We are contributing to a collaborative paper which will make recommendations to water companies, Ofwat and Market Operator Services Limited ('MOSL'). One of our recommendations would lead to standardising groups of customers, supporting the breakdown of NHH customer demographics. This will support alignment and innovation, while delivering best practices across the industry.

For the future

Thanks to the success of our Green Recovery smart metering project - alongside the momentum built through our core metering activity - we were recognised as a delivery leader in the sector. This strong track record was instrumental in securing accelerated AMP8 funding through Defra, as part of the Water Resources Management Plan ('WRMP') process. Our ability to deliver at scale, innovate in complex environments and engage customers effectively gave the regulator confidence that we could go further, faster.

This additional investment is enabling us to accelerate our ambitious AMP8 metering strategy, which includes the installation of over one million smart meters across our region. The majority of these will be new installations, helping us reach more unmetered households and drive significant reductions in consumption and leakage. It also supports our longer-term goal of achieving 90% metering coverage by 2050. The insights gained through Green Recovery are now embedded in our AMP8 delivery model, helping us refine our approach and maximise value across the project.

FASTER **ENVIRONMENTAL IMPROVEMENTS**

Early delivery of Water Framework Directive ('WFD') improvements

We have now delivered improvements to 21 WFD measures, some five years earlier than we originally planned. As well as early delivery – bringing the benefits to customers and our environment sooner – we have been able to bring through more improvements than we had forecast.

Key to this success has been working with our Tier 1 supply chain from an early stage - providing insight into the project and using their expertise to better understand buildability and risk management. This slimmed-down process time, and trialling new approaches meant quicker design and delivery.

This has also meant growing the capabilities of our contractors, so more firms can now deliver more complicated or larger-scale projects. Improving our supply chain is going to see benefits across the AMP8 programme.

Our Rivers

Derbyshire

- 15 CSO interventions delivered to improve river health
- A nature-based solution has been installed at Dalbury Lees to remove phosphorus from Radbourne brook

Nottinghamshire

- 6 strategic projects delivered across Nottinghamshire to optimise stormwater management and support river system resilience
- 6 projects across the River Maun and Idle are in progress with a total planned investment of £62m

River Trent

- 7 phosphate removal schemes installed to enhance water quality in targeted areas of the Trent tributary

Leicestershire

- Nature-based solutions installed at Hungarton Waste Water Treatment Works using chemical free phosphate removal and improving the river Wreake
- 11 CSO projects completed to improve river health
- We have successfully delivered upgrades at Snarestone to meet a new, more stringent phosphate standard of 0.25 mg/L, supporting improved water quality in the River Mease

Warwickshire

- We have begun significant investment at Longbridge treatment works which is due to complete in 2027
- A total of 10 projects in progress improving the River Avon

Gloucestershire and Worcestershire

- Sedgeberrow Wastewater Treatment Works – a new chemical dosing system and tertiary solids removal kit installed
- Improvements in place at Winchcombe Wastewater Treatment Works to meet a tighter permit protecting the River Isbourne

Storm simulation for smarter solutions

One of the key challenges in developing effective stormwater technologies is the ability to test them under a wide range of storm conditions. To generate reliable, repeatable results, we need controlled environments that can simulate the complexity of real-world events.

To address this, we have developed a Storm Generator at our Spernal Wastewater Treatment Works. This facility allows us to simulate a variety of storm profiles on demand, enabling rigorous testing of different treatment solutions. By combining this physical testing capability with advanced data analytics and hydraulic modelling, we can create and evaluate a broad spectrum of scenarios - accelerating innovation and improving the resilience of our wastewater network.

This project is aimed at building and testing a system that represents different storm scenarios, simulating CSO's at different flows and volumes.

The Storm Generator was designed to produce repeatable flows based on parameters identified in the project's storm overflow analysis phase, while considering the existing site infrastructure. The final design solution (consisting of pumps, pipes, tanks, and a control system), generated flows within the site's constraints, achieving as close to the desired flow parameters as reasonably possible. The intention was to create a pilot test facility to evaluate the efficacy of various treatment.

In this project, two solutions for treating CSO water, SciCloneX and Mecana, were evaluated. The goal was to identify technologies with a small footprint that could effectively reduce concentrations in CSO. Tests were conducted both with and without coagulants, specifically traditional ferric sulphate and the organic coagulant Hydrex:

- SciCloneX demonstrated high pollutant removal efficiency when both ferric sulphate and Hydrex were used together. It emerged as a straightforward solution.
- Mecana - excellent pollutant removal efficiency, both with and without the use of coagulants.

Both systems contribute to enhanced environmental protection by supporting compliance with total phosphorus and orthophosphate standards, aligned with the Urban Wastewater Treatment Directive ('UWWTD'). These advanced technologies play a key role in optimising wastewater treatment performance, promoting sustainable water management and improving river water quality.

You can see the full technical trials report here.

Longbridge Wastewater Treatment Works: a flagship project

Longbridge Wastewater Treatment Works, near the banks of the River Avon south-west of Warwick, has benefited from one of the largest wastewater investments under this Green Recovery initiative to address a number of challenges faced. We have gone above and beyond our original Green Recovery phosphorus removal scheme and taken a step back and reviewed the long-term plans for the catchment to ensure our solution is future-proof. This additional work has been funded through transition expenditure.

The Warwick and Leamington Spa area is experiencing significant economic and population growth, and to meet this challenge, alongside other factors such as climate change, we developed a bold investment plan. We are building a brand new side-stream at the Longbridge Wastewater Treatment Works that will increase the capacity of the existing facility by 72%, as well as delivering chemical dosing and tertiary solids removal across the whole site. This not only enhances the reliability of the network during heavy rainfall, but also improves the quality of treated water returned to the environment, contributing to healthier rivers.

This forward-looking approach ensures that our investments today will have a lasting impact and help build the resilience of our systems for the future. Longbridge is now better equipped to handle extreme weather events, reliably and to higher standards.

21 WFD points delivered

Delivering early and moving faster

Within this project, we have been able to deliver early improvements to the quality of our rivers, through 45 critical projects, each designed to meet tighter environmental standards. We are seeing significantly reduced phosphorus levels in rivers in our region, helping to drive the ecological status of our rivers toward the Good status that our customers, communities and regulators rightly expect.

Our analysis shows that, due to our Green Recovery projects alone, we will be removing approximately 480 kg of phosphorus per day from our rivers - equivalent to 175 tonnes annually. A step forward in protecting and enhancing the health of our rivers, benefiting both the environment and the communities that enjoy and depend on them.

Green Recovery has given us the opportunity to try different approaches and use new methods to help us prepare for AMP8. As a result, we were able to accelerate parts of the project by challenging ourselves, our suppliers and our contractors and by procuring equipment in advance.

We focused on the following key areas:

- Using the supply chain better - using their expertise and experience to get quicker decisions on feasibility, scope and constructability.
- Owning risk in the right places - moving from a very risk-averse position to a future where we identify the correct owner of risk and not paying for things we can better manage ourselves.
- Developing our contractors - helping our partners, especially smaller firms, so they can grow and deliver more complex jobs.

In our original Green Recovery Final Determination our objective was to deliver projects worth 7 WFD by 31 March 2025. However, we set ourselves an ambition to go faster, agreeing with the Environment Agency to aim to deliver 19 WFD points by 31 March 2025, with the remainder due by the end of March 2026, March 2027 or December 2027. All permit limits and waterbody modelling were agreed with the Environment Agency early in the project along with delivery dates.

Thanks to the hard work and dedication of our teams, we managed to deliver projects representing 21 WFD points by 31 March 2025, which have been accepted by the Environment Agency. The remainder are on track for delivery before the end of 2027, in line with the planned delivery timetable.

This table details all the phosphorus removal schemes that we have delivered, to sign off the WFD points and more importantly reduce the levels of phosphorus in the rivers. Those sites will now have Environment Agency permits that will hold us to new and more stringent levels of phosphorus discharge.

Delivery	WFD Points	Sites	Environment Agency Agreed Date	P annual average permit (mg/l)	Scheme
7 WFD points stipulated in FD	2	Alveley STW	March 2025	0.35	Chemical dosing and Tertiary solids removal ('TSR') and new sludge pumps
	2	Blyton STW	March 2025	0.65	Chemical dosing, TSR, reedbeds and blowers
	1	Scotter STW	March 2025	1.35	Chemical dosing
	2	Willoughton STW	March 2025	0.3	Chemical dosing, TSR and humus tank
Additional 5 WFD points forecast for delivery in our PR24 submission	2	Dalbury Lees STW	March 2025	1.5	Reactive media reedbed
	1	Hungarton STW	March 2025	1.5	Reactive media reedbed
	2	North Wheatley	March 2025	0.65	Chemical Dosing, TSR, Humus Tank
Additional 9 WFD points agreed with the Environment Agency	4	East Markham	March 2025	0.35	Chemical Dosing, TSR, Alkalinity Dosing
	2	Snarestone STW	March 2025	0.25	Existing asset optimisation
	1	Sedgeberrow STW	March 2025	0.7	Chemical dosing, TSR
		Winchcombe STW	March 2025	0.37	Existing asset optimisation
	2	Worksop	March 2025	0.3	TSR

Managing Phosphorus in our waterways

Phosphorus plays a vital role in supporting life, but when levels become too high in rivers it can lead to serious environmental impacts. Excess phosphorus contributes to:

- Eutrophication – fuelling rapid algae growth that blocks sunlight and disrupts aquatic ecosystems.
- Oxygen depletion – as algae die and decompose, they consume oxygen, reducing levels needed by fish and other wildlife.
- Poor water clarity – high phosphorus can increase turbidity and organic build-up, further stressing aquatic life.
- Ecosystem imbalance – elevated nutrient levels can shift the natural food web, affecting biodiversity and water quality.

Phosphorus enters rivers from a range of sources, including agriculture, surface runoff, industry, and wastewater. That is why targeted monitoring and collaborative management are essential to protect and restore healthy water environments.

Nature-based solutions

In the last year we have successfully commissioned two nature-based solutions and their performance has so far exceeded our initial expectations. We installed reactive reedbeds at Hungarton and Dalbury Lees Wastewater Treatment Works. These reactive media reedbeds provide chemical-free phosphorus removal. A specially designed media in the reedbed binds and encapsulates the phosphorus until it is eventually removed when the media is replaced.

This Enhanced Biological Phosphorus Removal ('EBPR') uses naturally-occurring, carefully-nurtured biological processes and environmental conditions to efficiently extract phosphorus from wastewater. We are creating the condition in which the bacteria in the activated sludge plant can capture the phosphorus and lock it in. We carefully monitor conditions and feed the bacteria the right amount of air and nutrients so it can use the wastewater as food. This means we do not have to use coagulant chemicals, a significant departure from traditional treatment methods. It is not only more efficient but also significantly better for the environment, as it reduces the reliance on chemicals that can often have harmful side effects. These methods have opened up new opportunities for us to take into the future. We are working on how we can make them more viable for widespread implementation.

We envision scaling up these nature-based solutions as a core component of our rural strategy, particularly in the treatment of phosphorus and the overall enhancement of river water quality.

By investing in and expanding these solutions, we aim to contribute to the long-term health of our rivers and ensuring compliance with our permits while maintaining our commitment to sustainable, environmentally-friendly practices.

Innovation and low cost solutions

One of our key objectives has been to significantly reduce the number of spills from CSOs, thereby improving the health of rivers across our region. We have used Artificial Intelligence ('AI') to identify opportunities for improvements. By identifying quick wins first, we can improve performance quickly and efficiently. For example, raising the weir height – the level above which a CSO might spill – can make a big difference at relatively low cost.

We started by analysing Event Duration Monitor data, which tells us the maximum water depth over the weir height for each spill event. This gave us a threshold: if a weir is raised to cover the spill depth, the spill could potentially be avoided. Sites where the spill was within 100 mm of the weir height, were identified as the most straightforward to address. At the same time, we reviewed asset records to assess their suitability for modification. Some sites are complicated installations with mechanical screens or interactions with other assets that make them unsuitable for alteration. This step helped narrow down the pool of candidate sites to those that were most likely to benefit from an intervention.

Once we had identified the most suitable potential sites, focusing on those that showed a theoretical benefit in reducing spills and were technically feasible for modification, we used hydraulic modelling to see how changes to weir heights might impact flow patterns and spill behaviour. We did not want interventions to have unintended consequences, such as increased flood risk or the creation of new spill events at different locations up or downstream in the network.

We worked alongside smaller, agile repair and maintenance contractors to increase the weir height at our chosen site. This meant we could make quick surveys and carry out the work faster. Many of them could be completed in just one day, ensuring minimal disruption to customers and local communities, and making swift improvements to the wastewater network.

We are already seeing the benefits of this innovation. On average, each weir raise intervention saves around 11 spills per year per overflow and throughout AMP8, these upgrades will support our infrastructure to deliver even greater results.

Coming next

We have made good progress in improving river health and wastewater infrastructure over the last three years. We have delivered an impressive number of projects in record time, accelerating improvements and contributing to the health of our local ecosystems. Green Recovery has given us the momentum and energy to launch 45 critical schemes. To date, we have completed 11 of these projects, with 34 more already underway to deliver the remaining WFD points.

Our teams are working on-site or in the advanced design phase of the remaining schemes, ensuring each one is tailored to meet the highest standards of efficiency and environmental stewardship. These sites will come online over the next two years and, when combined with the initiatives outlined in our AMP8 investment plan, this will mark the largest investment in the region's wastewater infrastructure in recent history.

This work will improve the quality and reliability of water services for our customers but importantly will also support the sustainable growth of the places where they live, for many years to come.

Delivery	WFD Points	Site	P annual average permit (mg/l)	Scheme
Schemes forecast for delivery in 2025/26	1	Bakewell - Pickory Corner STW	1.2	Asset optimisation
		Matlock STW	1	Chemical dosing
	3	Clay Cross STW	0.3	Chemical dosing and TSR
	1	Coaley STW	0.35	Chemical dosing and TSR
	1	Duffield STW	0.9	Chemical dosing
	1	Westwood Brook STW	0.4	Chemical dosing and TSR
	1	Heage STW	0.7	Chemical dosing and TSR and alkalinity dosing
		Swanwick STW	0.7	Chemical dosing and TSR and alkalinity dosing
		Ripley STW	0.7	Chemical dosing and TSR and alkalinity dosing
	1	South Normanton STW	0.4	Chemical dosing and TSR
		Huthwaite STW	0.5	Chemical dosing
Schemes forecast for delivery in 2026/27	1	Droitwich STW	0.4	Chemical dosing and TSR
	2	Edwinstowe STW	0.49	Chemical dosing and TSR
		Mansfield STW	0.2	Chemical dosing and TSR and new primary settlement tank
	1	Mattesey Thorpe STW	1.2	Chemical dosing
	2	Retford STW	0.3	Chemical dosing and TSR
	1	Sutton in Ashfield STW	0.2	Chemical dosing and TSR
Schemes forecast for delivery by December 2027	1	Alcester STW	0.97	Asset optimisation and Spernal getting to 0.2mg/L
		Bidford on Avon STW	0.25	New oxidation ditch with chemical dosing and TSR
		Blackminster STW	1	Asset optimisation
		Stratford upon Avon STW	0.25	Chemical dosing and TSR
	2	Snarrows STW	0.38	Chemical dosing and TSR
		Barrowand Quorn STW	0.79	Chemical dosing and TSR
		Hoton STW	2	Chemical dosing and reedbed refurbishment
		Wanlip STW	0.2	Chemical dosing and TSR
	2	Bredon STW	1	Chemical dosing
		Cropthorne Heath STW	1	Works rebuild plus chemical dosing
		Pershore STW	0.2	Chemical dosing and TSR
		Twynning STW	1	Chemical dosing
		Evesham STW	0.25	Chemical dosing and TSR
	2	Kegworth STW	0.75	Chemical dosing and TSR
	1	Longbridge STW	0.22	Chemical dosing and TSR
	2	Loughborough STW	0.2	Chemical dosing and TSR

MORE WATER FOR **MORE CUSTOMERS**

Increasing available water using sustainable practices

With a growing population and uncertainty caused by climate change, we need to be able to supply water for more people – safely, reliably and sustainably. Our Green Recovery water resources project aimed to increase our water treatment capacity by 93 Ml/d, through building new state-of-the-art water treatment facilities and supporting non-household customers to use water more efficiently.

The project comprised of the following:

- Non-household audits - working with schools and businesses to help them use water more wisely
- Floating wetlands pre-treatment - using nature to treat water before it enters our water treatment works, by creating sustainable ecosystems
- Revitalising Witches Oak abstraction pumping station - making sure it operates as effectively and efficiently as possible
- Witches Oak Water Treatment Works ('WTW') - building a brand-new WTW
- Pilot plant - using an innovative process for the full-scale WTW, helping us to fine-tune processes, test new approaches, and set the gold standard for treating River Trent water
- Distribution pipeline - building new networks to send the treated water from Witches Oak WTW into our network

Non-household audits

Our main focus is on domestic household customers, who collectively are responsible for the majority of water use in our region. However, NHH customers can also have a positive impact on current and future consumption, by being as efficient as possible with how they use water.

To help raise awareness of water use with our NHH customers, we set out to assess 3,000 business customers across our region, with free no-obligation water audits. Our technicians carried out a full assessment at each site, fitting free water saving products, completing leakage detection and repairs, and, where relevant, installing loggers. Not only did our recommendations help to improve water efficiency for the customers, leading to financial savings in many cases, they also helped to reduce the amount of water we need to put into our network.

Performance and delivery

Over the lifetime of the project, we have successfully carried out 3,000 customer on-site audits. As a result of this activity alone, we believe we have saved 1.2 Ml/d.

We have targeted different types of businesses to see what impact we can have on water usage. One of the business sectors that we focused on was schools - our first set of visits was to 104 schools, of which only 22% needed remedial work and the volume of water saved was relatively low. By the end of the project, 65% of the schools we visited required remedial work, which has driven more water savings. We have worked with our supplier Aqualogic, to develop robust key performance indicators, with regular reviews to maximise water savings and cost efficiency.

Another business sector we looked at was hairdressers, as we identified them as key water users. However, individually these businesses tend to be relatively small, and the overall water savings were not large in volume.

We saw more success in the hospitality sector. At one hotel in Leicestershire we were able to make savings of more than 4,000 litres per day, for example.

All this work has helped to influence our strategy going into the next AMP and we will be able more effectively to target specific businesses that we believe can give us the best impact.

0.227 Ml/d saved over 601 schools

Targeting the right customers

We used a variety of strategies to communicate with businesses about our audits including emails, letters and advertising, but had the most success when we called them directly and talked them through our offering. When we had the chance to have a conversation, companies realised what was involved and the dropout rate was considerably less than with other methods of contact.

We also prioritised engagement with businesses that have larger workforces and substantial customer footfall, as these sites typically demonstrate higher-than-average water usage. This allowed for greater potential savings. By using sector-specific data on water consumption, we were able to identify and target business types with the highest opportunities for efficiency improvements.

61% of the audits undertaken resulted in water savings being made

Nottingham football ground

Towards the conclusion of this project, we successfully engaged Notts County Football Club to assess the scope and complexity of conducting a water audit and installation at a large sporting venue. Given the number of similar facilities within the Severn Trent region, this provided an opportunity to evaluate their suitability as a target group for work in AMP8.

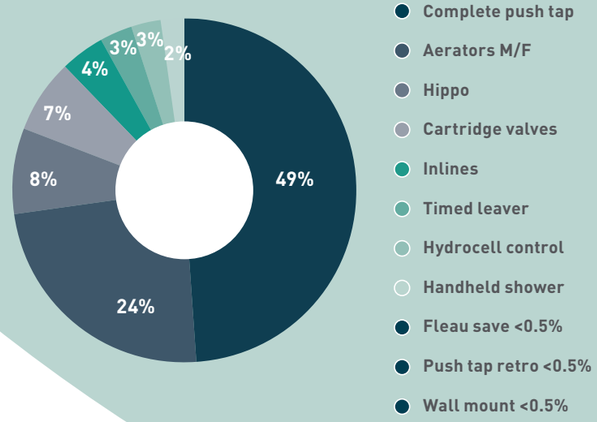
Due to the scale and volume of water efficiency work required this installation exceeded the timeframe of the original project. In total, we installed 262 push taps and 71 urinal controls, alongside a substantial number of repairs to existing infrastructure. These interventions resulted in water savings of approximately 13,000 litres per day—equating to a 42% reduction in the site's overall water usage.

Water saving products

Over the project lifetime we installed 21,133 products in our business customers' properties. We used a variety of water saving products, ranging from Hippo bags in toilets, to reduce the volume of water in each flush, to Hydrocells, which help to eliminate the continual flushing of urinal cisterns and stood out as our top water-saving solution.

The product we have installed most is the push tap, to replace existing twist taps with excessive flow rates or faulty push taps. We installed a total of 10,408 push taps, accounting for 49% of all our installations. We also achieved further success from fitting inline flow valves, to reduce tap flow rates from over 10 litres per minute to 6 litres per minute.

Water saving products



Push taps were the best value product in terms of cost per litre saved

Customer feedback

It is important to us that all our customers are treated well and are confident about the work we do with them to manage their water use. To gain an understanding of the customer experience in relation to this work, we closely monitored customer feedback following first (assessment) and second (installation) visits. We designed customised surveys, both for those customers who did not need remedial work and for those needing a second visit.

Using online surveys to give us feedback, customers showed an 92% satisfaction rate for our visits. Additionally, we received a 100% rating for the professionalism of our technicians and a 4.57/5 rating for the audit reports themselves. We assessed and shared the feedback continually throughout the project to manage performance.

Highest volume of water saved per product was achieved by the Hydrosell urinal controls at 697 litres per day

Links to the AMP8 business demand Outcome Delivery Incentive ('ODI')

The most valuable lessons we have learned, which will help us perform better for future water efficiency activities, were:

- improving data for customer contact
- using criteria-based telemarketing
- assessing business personas to target the most inefficient customer types

As well as focusing on the right types of business:

- a high volume of urinals
- a large workforce
- a good customer base

The data gained from this project means we can now target business in terms of pence per litre savings, making our engagement even more effective.

Effective collaboration with businesses including data sharing, non-competitive activities and higher levels of engagement proved effective and will be key to successful delivery of the Business Demand ODI in AMP8. This project has provided a great starting point and established a wealth of learnings, but we are not stopping here - there is still plenty to learn from the data we have gathered, and further opportunity to improve savings and reduce costs. As we move into AMP8 we will be more selective with the products we replace and will look for new and innovative products in the market.

Water resources

Our water resources Green Recovery project was driven by a commitment to long-term water supply resilience. It included the refurbishment of the Witches Oak Abstraction pumping station to ensure a reliable raw water intake, alongside the creation of innovative floating wetlands for biological pre-treatment. At its core is the design and construction of the new Witches Oak WTW, built to treat water abstracted from the River Trent. A key facilitator of this new WTW was the design, build, and operation of a pilot plant, which defined the treatment parameters for the full-scale facility. The project also delivered the essential infrastructure to integrate the treated water from Witches Oak WTW into our network.

This project illustrates how we have built resilience in our water supply network, using innovative and sustainable solutions to bring water supply back to more customers over the long term, strengthening the region's water security for the future.

Raw water abstraction

Historically, nitrate levels in the River Trent, which feeds the Witches Oak gravel pit lakes, were relatively high. This restriction, together with other water quality challenges such as levels of organics, eventually led to the original abstraction pumping station built in the 1990s being closed.

Our work on the abstraction concentrated on reusing existing structures where possible, while building new assets as needed to maximise reliable water supply. We refurbished the existing wet well and control building and installed three new transfer pumps able to deliver enough pre-treated water for a city the size of Derby. We also recommissioned one of our existing assets, a disused pipeline between the abstraction pumping station and Witches Oak WTW.

A new coffer dam at the abstraction inlet protected the site from the impact of flooding on the River Trent during construction. This dam protected the site during extreme weather events in 2024, allowing us to keep construction on track.

Protecting local fish

The River Trent supports a rich and diverse species population, including barbel, bream, chub, roach, and multiple eel species. To enhance ecological connectivity and biodiversity, we re-opened historic culverts linking the River Trent with adjacent gravel pit lakes. Newly constructed channels now enable bidirectional fish and eel passage, transforming these areas into vital nursery habitats and significantly improving the river's ecological resilience.

To comply with the Eels (England and Wales) Regulations 2009 we installed eel screens at the abstraction pumping station together with a return channel so that any eels or fish at the pumping station can safely return to the river.

Pilot plant

Our pilot plant successfully tested a range of technologies replicating the full size WTW to determine a number of factors, including chemical dose rates, backwash sequencing and intervals, control system and software, and different types of media and its life expectancy. The pilot plant has enabled us to update membrane control software with backwash settings and chemical dose rates.

Our most recent activity at the pilot plant has seen us successfully testing treatment of water from both the River Trent and River Derwent, helping us understand the changes in chemical dosing rates when transitioning from one river source to another.

We have also run trials on a range of carbon filter media to determine their performance at removing pesticides, PFAS and organics. This has helped us determine the best value solution for PFAS removal in our future AMP8 project, we have been sharing our findings with the DWI and the wider water industry.

Witches Oak Water Treatment Works

Our new Witches Oak WTW is capable of supplying an average of 65 Ml/d treated water to our network and with a maximum inlet flow of 93 Ml/d, we can produce enough treated water for over 220,000 households.

We began commissioning in December 2024 and have been increasing the volume of water treated throughout the spring. We have not wasted this commissioning water, returning it to the adjacent reservoir so that our existing Church Wilne WTW can benefit from this water.

PFAS

Two years into construction, water quality sampling showed that the River Trent has high concentrations of PFAS. PFAS are a group of thousands of synthetic chemicals that are widely used in industrial and household products. They are commonly referred to as 'forever chemicals' – given their persistence in the environment and resistance to biodegradation – and you'll likely have seen PFAS mentioned in the media.

PFAS chemicals have been widely used since the 1940s, most commonly for their non-stick properties – which increase the durability of everyday items. As PFAS-coated items are discarded into landfill, and used in fire-fighting activity (such as fire extinguishing foams), they ultimately end up in a number of water sources through no fault of water companies – such as groundwater, rivers, lakes and other waterbodies. In our region, we also have a high proportion of industry and manufacturing, which can lead to trade effluent sources of PFAS.

We used a future-proofed WTW design so we can in the future expand our operations to deal with emerging risks such as PFAS. To prevent the PFAS from delaying our work, we amended the new WTW to enable treatment of raw water from the River Derwent as an alternative source.

Construction

We are delighted to have completed construction of the Witches Oak WTW in half the time of comparable projects, despite the particularly wet winters for the last two years. To reduce weather-related delays we prioritised offsite manufacture wherever possible, for example the administration and control building which was constructed and fitted out in a factory and then shipped to site and assembled in a short period of time.

We used 3D and 4D modelling to carry out 'dry runs' of construction and commissioning. 4D modelling allows multiple parts of the project to be planned safely, considering construction sequencing. For example, we installed the main below ground interstage pipework, while completing the chemical delivery bunds. We then constructed the main access roads over the process pipework at the same time as installing the chemical storage and dosing systems.

The WTW uses ultra-violet ('UV') light for disinfection, which is a first for a WTW at Severn Trent. As a result of the learnings we made, we were able to write a new UV design standard following this project.

The roof of the administration building on the site has solar panels installed to support our electricity requirements. We have also designed the roofs of the membrane building, GAC and high lift pumping station buildings so we can install solar panels in the future.

Ceramic membranes

We centred the treatment at Witches Oak around ceramic membrane technology. We are using 14 membrane units to give us enough capacity, installing an additional overhead crane in the membrane building to speed up membrane loading. During the build, we were able to load membranes on schedule, with fewer breakages than we planned for.

This membrane technology provides effective removal of pathogens, suspended solids and organic compounds resulting in high-quality water. Ceramic membranes are stronger, effective at microfiltration, more resistant to fouling, easier to clean and with lower maintenance requirements than other membrane types. We expect the membranes will last at least 20 years before they need to be replaced.

Witches Oak Water Treatment Works


March 2023


December 2023


September 2024


May 2025

Wetlands water pre-treatment

All 31 floating wetlands are fully installed and thriving at Witches Oak. This is the first time in the UK that wetlands have been used for operational water pre-treatment on this scale. Studies show that, on average, these floating wetlands could remove around 40-60% of both total nitrogen (ammonia, organic and oxidised nitrogen) and total suspended solids (particles >2 microns). This will considerably reduce the amount of energy and chemicals we then need to use at Witches Oak WTW.

We brought the construction forward of the first three reedbeds by 18 months so we could test the anchored system. We then installed the remaining 28 reedbeds a full 12 months early to maximise growth of the roots before the reedbeds were fully commissioned.

We chose to use floating wetlands over conventional or static wetlands because Witches Oak floods regularly during the winter and the pontoons containing the reedbeds can rise and fall with the water level. This was tested in winter 2023/24 when the site experienced extensive 1 in 100-year flood events. The floating solution also typically requires less maintenance, including no watering or fertilisation. We can tow them to the bank using a small motor launch to work on them if needed.

Distribution pipelines

We have built twin new pipelines between Witches Oak WTW and the Derwent Valley Aqueduct, which will be the main route for treated water from the new WTW into the Severn Trent water network.

With the future in mind, we installed T-pieces and valves so we can make a connection to the local Strelley system if needed. This will give us the option to refurbish Strelley pumping station rather than having to build new - this is a project we have planned for AMP8.

Ragdale Booster

We have designed and built a mobile pumping station, an innovative solution that we can use to boost flows to Ragdale Reservoir in the event of a failure of nearby Melbourne WTW. The booster consists of three containerised pump sets with mobile generators. We have added a new connection on the Ragdale main for this pumping station comprising of a track and some hardstanding for the pumps. We are sowing the rest of the site as a wildflower meadow.

Being mobile, we can also deploy the booster in other areas in the event of a failure.

Melbourne Resilience Project

As part of the project we have built a further pumping station at Melbourne WTW, to give us resilience in the event of a failure of Melbourne WTW. It means we can continue to supply drinking water to the local village of Smisby and surrounding areas. In normal operation it works when needed to help at peak times.

Biodiversity

At Witches Oak gravel pit lakes, we have been working in partnership with Derbyshire Wildlife Trust to provide a wide range of biodiversity net gain interventions.

Derbyshire Wildlife Trust manage the site for us so they were best placed to determine what improvement works we should undertake for biodiversity. Our work includes reed planting, wildflower sowing, grazing by cattle, bird nest boxes, osprey nesting platforms, and removing invasive species such as Himalayan balsam.

Over 10,000 m^2 of existing reedbed habitat has been cleared of invasive willow and other undesirable plants, and we are pleased that it is now in the best condition it has ever been. Bittern, a rare species of bird, has been spotted on site in greater numbers than ever before and we are hopeful that breeding might take place for the first time on site in 2025.

The River Trent meander area will now be managed by several Exmoor ponies for 6-8 months a year. Our ultimate aim is to give the ponies free reign of the site as natural habitat managers.

We are in the final stages of creating 5,000 m^2 of new reedbed to complement the existing reedbed habitat on site and have also installed more than 200m of boardwalk to improve access across the site for land management and managed visitor groups.

Nearby at Ragdale, we are converting a low-quality agricultural field into 3 ha of species-rich meadow grassland and planting over 600 trees to provide a major biodiversity boost for the area, improving links with the nearby SSSI and Nature Reserve.

In addition, the floating reedbeds themselves also give some biodiversity net gain – they are planted with several types of sedge, hard rush and flowering species, including purple loosestrife and meadow sweet, and in the first year we had terns nesting on them.

RIVERS SAFE **FOR SWIMMING**

Making the Teme, Leam and Avon better places to be

Our region's rivers are vitally important, as places to live, work, or simply enjoy. Our bathing rivers project was designed to help us understand the impact of making changes to our operations, reducing our impact on water quality in sections of the Rivers Teme, Leam and Avon.

The changes we have brought in under this part of the project include:

- Treatment works improvements – using Ozone disinfection technology for wastewater treatment at Frankton, Ludlow and Itchen Bank.
- Network storm overflows – reducing the impact of storm overflows upstream of the target areas on the Rivers Avon, Leam and Teme.
- Technology and engagement – joined-up monitoring of water quality monitoring, with information shared openly to help the public make decisions about river use.

Local communities

Given the potential for this project to affect a wide range of people, early and inclusive engagement was essential. We adopted a community-focused approach to raise awareness among customers, local groups, and councillors about the challenges facing our water environment and the importance of collective action.

By building understanding and support from the outset, we created a strong foundation for smooth project delivery and long-term collaboration.

Improving the health of our rivers is a shared responsibility. It requires coordinated efforts from water companies, industry, agriculture, communities, and individuals. Whether it is adopting new technologies to enhance treatment processes, managing runoff from roads and fields, or making small changes like only flushing appropriate items, every action contributes to a cleaner, more resilient water environment.

We undertook the following as part of our engagement activities:

- Presentations to Ludlow, Leamington and Warwick town council explaining how storm overflows work, and the increasing pressures from climate, urban challenges and housing development. These helped to upskill councillors on broader decisions and their impact on our network and the environment.
- Similar presentations to community groups – such as ARCIC in Leamington. We have also attended events, such as Spark Ignite in Leamington and more particularly over summer 2024 including Coventry River Festival with Warwickshire Wildlife Trust.
- Working through our Get River Positive Advisory Panel – who helped us shape our storm overflow map. Members include Severn Rivers Trust ('SRT'), Trent Rivers Trust, Paddle UK, Swim England and the Wildlife Trust ('WT'). We have held site visits to storm tanks, surface water separation, overflows, and our remote water quality monitors.
- In summer 2024, we had a stall at 'Art in the Park' in Leamington. We spent time talking to customers to understand just how important rivers are to people's mental and physical health – whether they use them to swim, paddle, fish in or walk alongside. It was fantastic to hear about the best local spots, undertake some fun river-related art and discuss how everyone can support rivers to thrive.

As well as helping explain our own work, we have also collaborated with others to help communities understand more about local water quality:

- On the River Teme near Ludlow, we have been working with SRT and the Environment Agency on Catchment Systems Thinking Co-operative project. Our involvement was focused on bacteriological water testing. This citizen science project has involved recruiting volunteers and scrutinising different techniques to effectively sample the bacterial content of the Teme. All the outputs from this project are shared quarterly at the national group meetings.
- In Warwickshire, our partnership with SRT has seen us supplying five 'water ranger' kits. These are used by local community groups once they have undergone training with SRT, with any data shared on an open platform. This is a great educational tool – we recently worked with the local sea scouts to train two groups to use them – while also collecting meaningful data.

Working with schools

Our Education Team worked collaboratively with SRT to deliver sessions for local schools. Through our partnership on this project they have helped us achieve a wider reach in communities through work in local schools – delivering assemblies and workshops on the wonderful life in our rivers and how to be water stewards.

We designed two different workshops and five assembly sessions and visited seven local schools, engaging with nearly 1,300 children, ahead of our 1,000 target.

Water quality testing – training volunteers

Helping local people to get involved is a key contributor to ongoing success. Alongside SRT we recruited volunteers to undertake water quality sampling – we had eight volunteers carrying out testing, across ten sites, and there were a number of enthusiastic volunteers on the waiting list to participate.

River usage surveys

It was important for us to understand the views of those who currently use the stretches of river we intended to improve. Building upon baseline work we already carry out with these communities, we consulted with more than 800 summer swimmers at two sites.

We also invited other visitors to these stretches of river to complete online surveys, giving people the opportunity to feedback about pollution and areas for improvement. To date, we have had more than 100 direct responses.

Month	Myton Fields	Saxon Mill
Winter season		
Total	**198**	**308**
Summer Season		
May 2024	62	93
June 2024	42	89
July 2024	74	98
August 2024	93	124
September 2024	65	72
Total	**336**	**476**

Our Bathing Rivers newsletter has been keeping the public informed of our project and our progress since 2022. Our final newsletter was published in May 2025. You can subscribe to our Get River Positive Newsletter **here** for updates on how we are continuing to make a difference to our rivers.

Farmer engagement

Shropshire and Warwickshire have a vibrant agricultural community - farmers and landowners can have a significant impact on the quality of rivers. We are engaging with community groups and local farmers in order to reduce the bacterial load entering the river from any sources. Our work to engage with farmers and landowners pre-dates the Bathing Rivers project and our continued partnership with farmers in our region has enabled us to safeguard water quality through various programmes and grants, including our Severn Trent Environmental Protection Scheme ('STEPS'). We have been awarding STEPS grants, for on-farm improvements that help protect water quality by reducing pesticide, nitrate and cryptosporidium from reaching raw watercourses since 2014.

Working with local farmers, we provided educational resources to raise awareness of cryptosporidium risks. We provided kits and funding for testing Cryptosporidium in cattle, and funded changes in farm practices to help them reduce livestock waste entering rivers. Our Test, Protect and Improve scheme was launched in early 2023 to support early detection of cryptosporidium in livestock herds. Early identification enables timely on-farm interventions, helping to reduce the spread of infection and, crucially, limiting the release of cryptosporidium into nearby rivers. This proactive approach plays a vital role in protecting river water quality—safeguarding ecosystems, supporting biodiversity, and ensuring rivers remain safe and enjoyable for recreational users.

Understanding the time, effort and organisation required to follow our recommendations, we developed financial support packages to cover farmers' costs for test activity. Over the two catchments, farms reported more than 5,900 livestock test results to us. Other support we offered included signposting them to external grant funding provided by other organisations and if necessary, funding a report from their farm vet.

Public application

We wanted to provide the public with information to help them make decisions about their own river use. Our public app gives bathers usable water quality forecast information so they can plan their bathing activities.

We looked at the tools currently used by bathers in the UK to help us develop something capable of providing the best view for our proposed bathing improvement areas. The existing apps/tools we looked at included:

- Surfers Against Sewage pollution alerts: this shows if there has been a sewage spill at a location with the last 48 hours. However, the information is for a specific point, it does not give an assessment ahead of time and it does not provide a view of the bacteria risk, assuming overflows are the only source of risk.
- Copenhagen water quality map: this was commissioned by and prepared for a number of Danish municipalities and water supply companies. It considers other elements beyond sewer overflows but is a coastal map and therefore discrete to specific locations.
- Proteus water quality monitor: we considered this as a surrogate for bathing indicator parameters. However, we felt that analysis and pattern matching required for this was not suitable for our deployment.
- EA SWIMFO website: the focus of this tool is for designated locations only and mostly our bathing rivers project targeted areas are not designated. Information provided by the Environment Agency on SWIMFO displays a pollution risk forecast by looking at trends in past data to predict average water quality. If the average quality is forecast to be above a warning threshold, then a pollution risk warning is issued for the day.
- Safeswim: a system adopted by Auckland Council that provides predictive water quality insights. We had constructive meetings with Auckland Council and heard from them, their learnings about rolling out such an app and how information is received by the public. We consider this to be among the best platforms internationally.

Learning from these other platforms, we decided to design our customer tool on a similar basis to Safeswim and we believe we have gone further than other tools currently available in the UK.

It was never the intention of our project to measure bathing quality in real time. Typically, it takes 12-24 hours to obtain a sample and test it in a laboratory, so any data collected this way would be retrospective and not useful for an individual planning on visiting the river the same day.

Instead, we created an E.coli and Intestinal Enterococci Risk Forecast Tool to forecast the levels of these two bacteria types in the river. We built models of the river stretches in the project, using water quality samples collected over a period of time at multiple points and calibrated them against rainfall data. Our forecast tool uses the weather forecast to give a predicted river water quality status for any point selected on the highlighted river. The tool uses a combination of modelled data: our sewer network model, a river model and the weather forecast. This means recreational users can use this indicative forecast and our storm overflow map to inform their decisions on how they interact with the river environment.

Risk Forecast Tool

Storm Overflow EDM Map

Water quality results

Ahead of delivering any solutions we carried out extensive sampling and testing of the rivers. This is the results of the baseline sampling done on the Rivers ahead of any of the Bathing River project interventions. Further sampling will be carried out in the next Bathing season to identify how much improvement has been made following the installation of our schemes.

Bathing rivers baseline data

Designation

The newly designated Bathing Water site on the River Teme at Ludlow, Shropshire, was classified as 'Poor' prior to the implementation of our planned interventions. This classification coincided with recent media coverage highlighting agricultural pollution in the Ludlow area. While these issues underscore the challenges we face, they also reinforce the importance of our ongoing efforts. Our work in this catchment, particularly our engagement with local farmers, is vital to improving water quality and supporting the long-term success of the designation.

In Warwickshire, community interest in Bathing Water designation has been renewed along the River Avon near St Nicholas Park. Local groups, including boat users and swimmers, are actively involved in water quality monitoring through the Water Rangers programme. Their efforts reflect a growing public commitment to enhancing and protecting our rivers for recreational use.

Defra have opened a public consultation on Bathing Water designations, encouraging input from a variety of sources. They are consulting on five main reforms:

- Expanding the definition of 'bathers' to include all water users;
- Removing fixed bathing season dates;
- Introducing multiple monitoring points to better classify water quality;
- Removing automatic de-designation for sites that get 'Poor' for five years; and
- Deciding if it is feasible to improve a site's water quality to at least 'sufficient' and using that as a criteria for final designation.

Interested parties such as the Clean Water Sports Alliance and water companies have all considered and submitted their responses to the proposed changes.

Bathing rivers in AMP8

In May 2024, three locations in Ludlow, Shrewsbury and Ironbridge were designated as Bathing Waters in Shropshire, the first in our patch. The locations were sampled by the Environment Agency and assigned a classification of 'Poor' status at the end of the bathing season. As part of our AMP8 Bathing Rivers programme, we shall be investigating these bathing waters and compiling solutions to make improvements to the classifications of these Bathing Waters.

Shrewsbury and Ironbridge have a mining history and are both subject to regular River Severn flood events, during which the Environment Agency install temporary flood mitigations. Additionally, Ironbridge is located in a UNESCO World Heritage site. These features will require us to deploy and adapt our lessons from Green Recovery to develop the appropriate water quality solutions.

Ludlow has the benefit of significant improvements to date as part of our Green Recovery activity. The newly designated status for the inland bathing waters which only came in place in the 2024 bathing season, after our work was completed or significantly underway, this means that some additional activity will be required and we will be investigating surface water separation improvements in this catchment.

Pioneering ozone treatment for cleaner water

We are leading the way in the UK by introducing ozone treatment into wastewater processes - an approach commonly used in drinking water treatment. As part of this innovative project, we have installed ozone systems at three sites: Ludlow in Shropshire, and Itchen Bank and Frankton in Warwickshire. At each location, ozone treatment has been added as an advanced final step in the treatment process, helping us achieve water quality standards that go beyond current regulatory requirements.

Ozone treatment involves introducing ozone gas at a late stage in the wastewater treatment process, further removing any remaining bacteria. We closely monitor the treatment to ensure optimal performance and to prevent any unintended environmental effects. Beyond its effectiveness in disinfection, this project is also helping us explore ozone's potential to reduce micropollutants and pharmaceutical residues - offering valuable insights for future applications and further enhancing the quality of water returned to the environment.

How do we use ozone?

- **Ozone Generation:** Ozone (O_3) is produced from oxygen using electrical discharge.
- **Ozone Injection:** The ozone gas is injected into the wastewater stream.
- **Oxidation Reactions:** Ozone reacts with pollutants, breaking them down.
- **Final Polishing and Recovery:** Remaining particles are filtered out, and any residual ozone is removed by a destructor, contributing to a cleaner and more sustainable process.

Environmental benefits of ozone use

Ozone (O_3) is a naturally occurring molecule that breaks down quickly into oxygen (O_2), leaving no lasting impact on the environment. Its short lifespan and powerful disinfecting properties make it a sustainable choice for water treatment.

Key environmental advantages include:

- It naturally reverts to oxygen after use, producing no harmful residues or secondary pollutants.
- Even at low doses, ozone is a highly effective disinfectant, capable of neutralizing a wide range of microorganisms such as bacteria, viruses, and fungi.
- It also contributes to the reduction or removal of trace contaminants, including pharmaceuticals, personal care products, and other organic compounds.

Challenges and learnings

We been engaging regularly with the Environment Agency to agree how we measure the performance of the ozone treatment plants and we will continue sharing our data to gain as much learning from this as we can. These positive conversations have added key insight and perspective for the monitoring requirements of the project.

Setting up supply chains for new technology had some challenges due to the need for embedding ways of working with new partners. We quickly learned that delivery workshops are beneficial across the full supply chain to ensure all teams that interact with the new plant gain a full understanding of the processes, timelines and scope.

Offsite construction and fabrication was a key project enabler. Undertaking testing and fault finding in a factory environment saved time as technical experts were immediately on hand to rectify any issues. This meant that once the treatment was delivered to site and installed, it was immediately ready to use.

Delivery of ozone treatment

We decided early on that we would build the new ozone treatment using our 'Plug and Play' approach, with units designed and constructed offsite before delivery. This made it easier for us to make quick progress, as we prepared the receiving sites for installation of the containerised units while they were being built. This approach also helped us to understand the best way to use this new technology depending on the type of wastewater we want it to work with. Our own laboratory testing on samples helped us decide how we optimised the full-scale installations. In addition, the Environment Agency are interested in the results and insights they give in understanding the real world efficacy using ozone disinfection.

We have been working with industry bodies such as UKWIR and Water UK to help share the learnings for wider use, as this has the potential to be transformative for the UK water industry.

> This is a pivotal moment for our bathing waters project. We are excited that the ozone treatment is now in operation and we are confident that it will make a difference. This could be a step change in how wastewater is treated in the UK.

Wilfred Denga, Bathing Rivers Project Lead at Severn Trent

In March 2025, our three sites became the UK's first fully operational ozone wastewater treatment plants.

Frankton Wastewater Treatment Works in Warwickshire serves 2,478 businesses and households treating up to 2 Ml/d.

In addition to the final effluent benefitting from the new ozone treatment, we have also added a Tertiary Solids Removal ('TSR').

Ludlow Wastewater Treatment Works in Shropshire serves 13,852 businesses and households, treating up to 8 Ml/d.

It is a strategic site for our river water quality work and the plant is designed to treat the additional flows arriving at the works as a result of our wider Bathing Rivers CSO improvements.

Itchen Bank Wastewater Treatment Works in Warwickshire serves 14,873 businesses and households, treating just over 7 Ml/d.

The site footprint was already at capacity so we expanded the boundary to provide space for the ozone treatment plant.

Delivering sustainable solutions for wet weather performance

In addition to wastewater treatment, as part of our Bathing Rivers project we worked on a variety of complementary solutions to reduce the use of CSOs and improve river quality, focusing on 24 storm overflows on the Rivers Leam, Avon and Teme.

We targeted stretches of river in Shropshire and Warwickshire that are popular for the wider community as well as open-water swimmers, kayakers, rowers, paddleboarders and anglers. This meant we were often working in tight, urban environments, collaborating with local residents and businesses to minimise disruption and being creative with our techniques, such as using tunnel boring machines to prevent the need for excavation.

Optimising solutions

We began this project by updating and testing our sewer network model, which shows the complete layout and likely performance of our assets, so that we could use it to model potential solutions.

To ensure we were decisive and efficient we increased our internal modelling resource and divided up the modelling to optimise solutions as fast as possible. Running a model for a catchment area the size of Coventry could take up to three weeks, however, by splitting the areas into smaller, isolated sections we could test individual solutions much more quickly.

Next are some examples of the work we have been delivering through this project.

Finham tanks

To protect the River Avon we installed a 'mega tank' at our Finham Sewage Treatment Works with a capacity of almost 4.9 million litres - the largest single storage tank we built through this project. This major investment enhances the site's ability to manage excess flows during heavy rainfall, supporting more consistent treatment performance and contributing to the long-term health of the river environment.

Constructing the tank presented challenges, for example ground conditions on site required an alternative construction method and design from traditional installations. The site situated on an aquifer that is connected to the river and dewatering would not be possible without a disproportionate increase in time and cost, so we designed a shallower but wider storm tank.

Our Integrated Project Team approach ('IPT') for agile design and delivery approach meant we could design and deliver the solution on time. IPT has been a key way in which we have been able to overcome the time challenges associated with delivery of this ambitious programme, by completing activities in parallel that would traditionally take a sequential approach. The project began with a focused core team, which expanded over time to meet evolving demands. At the conclusion of the project, 87% of the team comprises individuals who have successfully retrained from various Severn Trent functions or other sectors, including automotive, facilities management, and academic research.

This diverse blend of backgrounds has enriched our delivery capability, bringing fresh perspectives and dynamic skill sets that complement our core engineering expertise. This re-skilling has been an opportunity adapt our approach to complement the core engineering skill sets with dynamic talents and ideas available from other, complimentary areas.

Dalehouse Lane network overflow tank

As part of the Dalehouse Lane Terminal Pumping Station ('TPS') upgrade, we designed, installed, and commissioned an enhanced offline stormwater storage solution. This included the construction of a new underground tank providing 550,000 litres of additional capacity. The new tank was connected to the existing storm tanks via a 450 mm diameter pipe, ensuring seamless integration with the current system. To further increase storage capacity, we raised the height of the existing weir wall surrounding the two existing tanks.

An innovative micro-tunnelling technique was employed to install the connecting pipework. This approach eliminated the need for deep open-cut trenches, significantly improving site safety and reducing the risk of disrupting existing underground services. The precision of the tunnelling machine also ensured a clean and efficient connection, minimising environmental impact while delivering a robust and future-proof solution for stormwater management.

Unicorn Lane network overflow tank

At Unicorn Lane we installed a large tank, with a capacity of 330,000 litres beneath a pub car park. We faced concerns from local businesses about disruption during the build, particularly in the run up to Christmas 2024. In addition, we required planning permission and needed to overcome various ecology requirements like tree protection.

By speaking openly and working alongside interested parties, we negotiated a start date of January 2025 for the main works, with some minor mobilisation works completed before the end of December 2024. In Leamington Spa, we have enhanced water quality in the River Leam through the implementation of innovative solutions that reduce reliance on storm overflows.

In Leamington Spa, we have improved water quality in the River Leam by using different solutions to reduce the use of storm overflows.

Leamington surface water separation

We undertook a major project to separate surface water from an area north east of Leamington covering 7.3 ha, capturing rainwater and surface water runoff in a new sub-surface network which is separate from our wastewater network.

This was a very challenging project, due to a number of factors including multiple road closures, nearby HS2 works, buried and uncharted services, and noise and vibration issues for local residents.

To ensure that our Tier 1 supply chain could focus on our existing AMP7 programmes, we targeted Tier 2 contractors and worked directly with them to complete the installation. This meant we needed to be more hands-on than before, but gave us the benefit of reduced cost and quick turnaround of plans.

Working in the highway is always a challenge due to multiple road closures. Our design phase, where we investigated ground conditions to determine the best construction technique, helped us understand the cost of delivering the solutions and also any risks that may need to be managed or mitigated.

In Leamington there were already roadworks planned in our areas of interest so we did a few things differently:

- We contacted third party companies already working in the roads to find out if we could work at the same time as them, preventing additional road closures and reducing disruption for customers and communities.
- We obtained ground condition insights where possible from these other contractors.
- We asked council planning teams for a schedule of the confirmed road closures and designed our works so that we could utilise the windows that were available. Again, reducing disruption for customers and communities.

Station Approach Shaft Tank

We built an 8x20 metre shaft tank at Station Approach in Leamington Spa, which is entirely concealed beneath the road, maintaining the visual integrity of the area while significantly enhancing the sewerage system's capacity. Located in a densely populated urban setting, close to the rail network, the river, and within the highway, the project presented considerable logistical challenges. Its proximity to residential and commercial buildings added further complexity, requiring meticulous planning and coordination throughout construction.

Despite these constraints, the project was successfully delivered thanks to innovative engineering solutions and exceptional stakeholder engagement. Close collaboration with local authorities, transport operators, and the community ensured minimal disruption and strong support, contributing to the overall success of the scheme.

Milverton School attenuation tank

Due to Leamington Spa's elevated topography, rainwater has historically placed pressure on the wastewater network during periods of heavy rainfall. To address this, we have re-engineered the drainage system north of the River Leam, including the construction of a 1.9 million-litre attenuation tank beneath the Milverton School playing field on Lillington Avenue. This infrastructure enables the separation of surface water from the main wastewater network, allowing rainwater to be temporarily stored and then released back into the river in a controlled and environmentally responsible manner. Other parts of Leamington may require a similar approach in the future and we will use the knowledge gained from this project to implement solutions.

We had a tight timescale for this project, as the school playing fields needed to be available to use in time for the winter term. As part of the larger Leamington scheme, the tank will help slow the flow of water captured from a new pipe system we have laid locally, separating rainwater from the sewage network, contributing to an improvement in river health.

> The new turf looks great, you wouldn't know there's a tank underneath, and children are excited to get back onto the field and enjoy a range of sports in the fresh air. We are grateful that Severn Trent have made it possible for children to still access the forest school during the work and have enjoyed seeing the diggers at work.
>
> **Matt Fisher,**
> **Headteacher Milverton Primary school**

CLEAR AND **TRANSPARENT REPORTING**

Being transparent in how we operate and report remains fundamental to our values and to the expectations of the water sector. We aim to present our performance in a way that is both clear and meaningful for our customers and stakeholders. To support this, we have consolidated the key data from our 2024/25 activities into a single, accessible section of this report.

Accelerating environmental improvements

Description		Units	APR22 reporting year	APR23 reporting year	APR24 reporting year	APR25 reporting year
Wastewater treatment works upgrade costs per upgrade		£ million	0	0	0	1.639
Wastewater treatment works upgrade WFD points		WFD Points	0	0	0	21
Wastewater treatment works upgrade phosphorus reduction		kg/day	0	0	0	480*
Storm Overflow Assessment Framework ('SOAF') costs per stage of SOAF	Stage 1	£	0	798.47	798.47	0
	Stage 2	£	0	0	8,205.06	0
	Stage 3/4	£	0	0	2,179.32	0
SOAFs completed	Stage 1	Number	0	130	0	0
	Stage 2	Number	0	0	73	0
	Stage 3/4	Number	0	0	53	0
Spill intervention costs		£ per intervention	0	0	59,368.14	27,687.61
Spill intervention benefit		Reduction in average annual spill days (d) / intervention	0	0	24.4	12.4
Spill interventions delivered		number	0	0	5	54

*forecast for the whole programme

Hampton Loade

We have continued to contribute to the Green Recovery scheme at Hampton Loade Water Treatment Works which is being delivered by South Staffordshire Water. This year, we have contributed £1.16 million to the delivery which is included in table 4S of the Severn Trent Water Annual Performance Report data tables, available in the Regulatory Library on the Severn Trent Water website. We understand that the scheme is not yet complete, and are forecasting *£1.17 million spend in AMP8.

*nominal price base

Building sustainable flood resilient communities

Description	Units	APR22 reporting year	APR23 reporting year	APR24 reporting year	APR25 reporting year
Grassed/planted detention basin storage volume delivered	m^3	0	0	2,703.6	9,838.1
Planted bioswale storage volume delivered	m^3	0	0	393.1	14,368.2
Rainwater planter storage volume delivered	m^3	0	0	0	14.9
Permeable paving storage volume delivered	m^3	0	205.0	1,040.2	1,652.9
Verge rain garden storage volume delivered	m^3	0	34.4	252.4	322.9
Street planter storage volume delivered	m^3	0	0	294.3	27.6
Bioretention tree pits storage volume delivered	m^3	0	0	8.2	0.0
Grassed/planted detention basin cost	£ million	0	0	5.701	10.137
Planted bioswale cost	£ million	0	0	3.599	52.013
Rainwater planter cost	£ million	0	0	0	0.062
Permeable paving cost	£ million	0	4.738	14.592	1.110
Verge rain garden cost	£ million	0	2.933	6.508	0.014
Street planter cost	£ million	0	0	7.405	-2.008
Bioretention tree pits cost	£ million	0	0	0.137	-0.037
Area of permeable paving delivered	m^2	0	804.0	4,079.4	6,481.9
Non-customer secured costs	£m	0	0.218	0.399	1.728

We have retained the original business case assumptions in reporting the volume storage, as this is the core drivers of the allowance. As we have worked through design and implementation of the SuDS features in Mansfield we have been able to identify more granular and better assumptions for assuming actual volume storage. For some interventions this is higher and for others lower. For urban streetscapes the new assumptions are closer to the original assumptions than nature-based solutions where the original assumptions seem to overstate the volume of storage that could be achieved. Monitoring of the interventions will continue to verify either set of assumptions or to determine other relevant factors. This provides valuable learning about the future capabilities and opportunities for SuDS.

Bathing rivers

Description	Units	APR22 reporting year	APR23 reporting year	APR24 reporting year	APR25 reporting year
Storm overflow intervention costs	£ million	0	0	0	33.479
Storm tank intervention costs	£ million	0	0	0	35.807
Wastewater treatment upgrade costs	£ million	0	0	0	9.431

Smart metering

Description	Further details		Units	APR22 reporting year	APR23 reporting year	APR24 reporting year	APR25 reporting year
Number of new meter installations	Screw-in		Number 000	0.165	15.326	11.192	16.783
	Internal		Number 000	0.000	0.000	0.001	0.113
	Boundary Box		Number 000	0.000	7.756	5.653	9.330
New meter installations – outturn costs	Screw-in		£ million	0.032	1.391	1.339	2.300
	Internal		£ million	0.000	0	0	0.019
	Boundary Box		£ million	0.000	2.254	2.080	3.569
Number of existing basic meter installations replaced with AMI capable smart meters			Number 000s	5.115	42.727	23.918	19.250
Existing basic meter installations replaced with AMI capable smart meters – outturn costs			£ million	0.711	1.883	1.682	1.591
Leakage savings from meter installations	New installations		Ml/d	0.000	0.265	0.872	1.326
	Replacements		Ml/d	0.000	0.115	0.295	0.496
Usage savings from meter installations	New installations	Reductions in direct usage	Ml/d	0.000	0.017	0.260	1.258
		Reductions in customers internal losses/wastage	Ml/d	0.000	0.502	1.626	2.463
	Replacements	Reductions in direct usage	Ml/d	0.000	0.000	0.475	0.758
		Reductions in customers internal losses/wastage	Ml/d	0.000	0.219	0.548	0.920
Percentage of household properties within your smart metering trial area covered by the company communication network			%	0.0	58.8	76.7	73.5
Percentage of smart meter installations in the smart meter trial area providing a successful daily transmission of data			%	0.0	32.3	60.7	69.4

To calculate the water savings from new smart meters we identify the start date (or installation date if we believe it was already leaking) and end date of the leak and multiple it by their average minimum daily water usage (i.e. what is flowing when the customer is not using anything) to calculate the total loss of water that would have occurred without the smart water meter. To calculate the water savings from smart meters replacing existing meters we are deriving the 'speed of find' and 'speed of fix' and comparing those values to equivalent values on non-smart meters. The difference between them is then multiplied by the average minimum daily water usage (i.e. what is flowing when the customer is not using anything) to calculate the total loss of water that would have occurred without the smart water meter. On average speed of find and fix on smart meters are over 100 days faster than on other meters.

The water saved is then divided between leakage (leaks on the supply pipe) and PCC (losses within the home). As we are unable to know where every leak is, we spend a bit of our time talking to our customers via different platforms to find out where they have fixed the leaks. We have determined from known leaks that 35% of losses are from the supply pipes or before internal stop taps, and therefore classed as leakage and 65% are from internal leaks such as leaky loos and dripping taps and therefore classed as PCC. We therefore apportion all savings to 65% PCC and 35% leakage. We notify the customers on installation if we believe there is already a problem.

To calculate usage savings we apply a structured A/B testing approach to quantify and report water savings:

Customer Updates: Once smart meter data is available, customers receive monthly usage reports comparing their consumption to past usage and similar households.

Metering Comparisons: Unmeasured customers are shown estimated bills based on actual usage to support informed switching to measured charges.

To report savings: A control group is established that receives no monthly updates or switching prompts.

For meter switchers, we compare their usage trends before and after switching against the control group to isolate the impact, adjusting for self-selection bias.

For non-switchers who will still get monthly updates, we compare usage from the first update onward against the control group. Pre-intervention data is typically unavailable, and all customers eventually receive updates, ensuring the test group is not biased. This methodology ensures reported savings reflect genuine behavioural change, using consistent and statistically sound comparisons.

To measure network coverage, we list the GPS co-ordinates of all properties with a water supply in the trial area and share this information with our data communications service provider. They then utilise their network planning software to determine which properties are covered by their LoRaWAN network, and which are not. This process is repeated for each reporting year, as coverage improves over time as a result of network densification and refinement. In our reportable figures we quote the percentage of properties covered if a meter were to be installed above-ground (spreading factor 7-12).

To measure the daily connection rate, we firstly record the number of days on which each smart meter has been in-situ in the reporting year. We sum this for all meters combined to arrive at a 'number of days in-situ' figure. We also record the number of days on which each smart meter has connected (returned a reading over the communications network) in the reporting year, and sum this for all meters combined to obtain a 'number of days connected' figure. By dividing the 'number of days connected' by the 'number of days in-situ' we determine the reportable daily connection rate (percentage) figure.

Water resources

The Witches Oak project, a key component of our Green Recovery programme, was originally scoped to abstract water from the River Trent and deliver a new treatment works. This scope was set out in Ofwat's Green Recovery Final Determination (July 2021) and Addendum (August 2022) - which was unrelated to PFAS. However, in mid-2022, the regulatory landscape changed significantly with the emergence of new guidance on per- and polyfluoroalkyl substances ('PFAS'), which had not been anticipated at the time of the Final Determination. In July 2022, the Drinking Water Inspectorate ('DWI') issued an Information Letter expanding PFAS monitoring requirements to include all individual PFAS compounds, beyond the previously regulated PFOA and PFOS. This was followed in August 2022 by Severn Trent's first Tier 3 wholesomeness breach at Church Wilne, confirming the presence of PFAS in the River Trent supply. These developments necessitated a fundamental redesign of the Witches Oak scheme to ensure compliance with evolving drinking water standards.

Rather than delay the project indefinitely or risk delivering a non-operational site, we acted decisively. We expanded the scope beyond what had been agreed to in the Final Determination to include a new raw water source from the River Derwent, alongside the design and construction of additional infrastructure to enable dual-source operation. This included:

- Pipeline interconnectors from the River Derwent intake to Witches Oak WTW;
- Raw water balance tank;
- Raw Water booster pumps to manage head differential; and
- Software and control modifications at the River Derwent intake.

These assets, delivered at a construction cost of £2.612 million, were implemented within an 11-month delivery window (Design & Procurement: Apr -Oct 2024; Construction: May -Dec 2024; Commissioning: Dec 2024 -Feb 2025).

Without this intervention, the site would have been physically complete but unable to supply water due to PFAS contamination in the River Trent. Our proactive response has ensured that the site will be operational by summer 2025, with emergency supply capability from the River Derwent as early as July 2025.

This demonstrates a clear commitment to public health, environmental protection, and long-term resilience. Importantly, this was achieved within a three-year delivery window - approximately a third faster than expected timelines for projects of this scale and complexity.

While the literal calculation of delivery for line 10E.24 stands at 92.3%, based on final commissioning stages, we have applied an executive overlay to report 100% completion in Table 10E. This reflects the fact that the original scope has been fully delivered, barring the commissioning which was held up due to the additional scope, which was only required due to unforeseen regulatory changes. The DWI notice relating to PFAS was received after the Final Determination was set, and without the funding to deliver an additional PFAS removal scheme during AMP7 we therefore consider that penalising the company for responding responsibly to a newly identified public health risk would be inconsistent with the principles of the Green Recovery initiative.

We request that Ofwat recognises the exceptional circumstances and supports our position that the allowance for this programme should remain intact.

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WONDERFUL ON TAP

SEVERN TRENT