

WATER RESOURCES MANAGEMENT PLAN 2024

Main Narrative

**SEVERN
TRENT**

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1. INTRODUCTION

WHO WE ARE AND WHAT WE DO

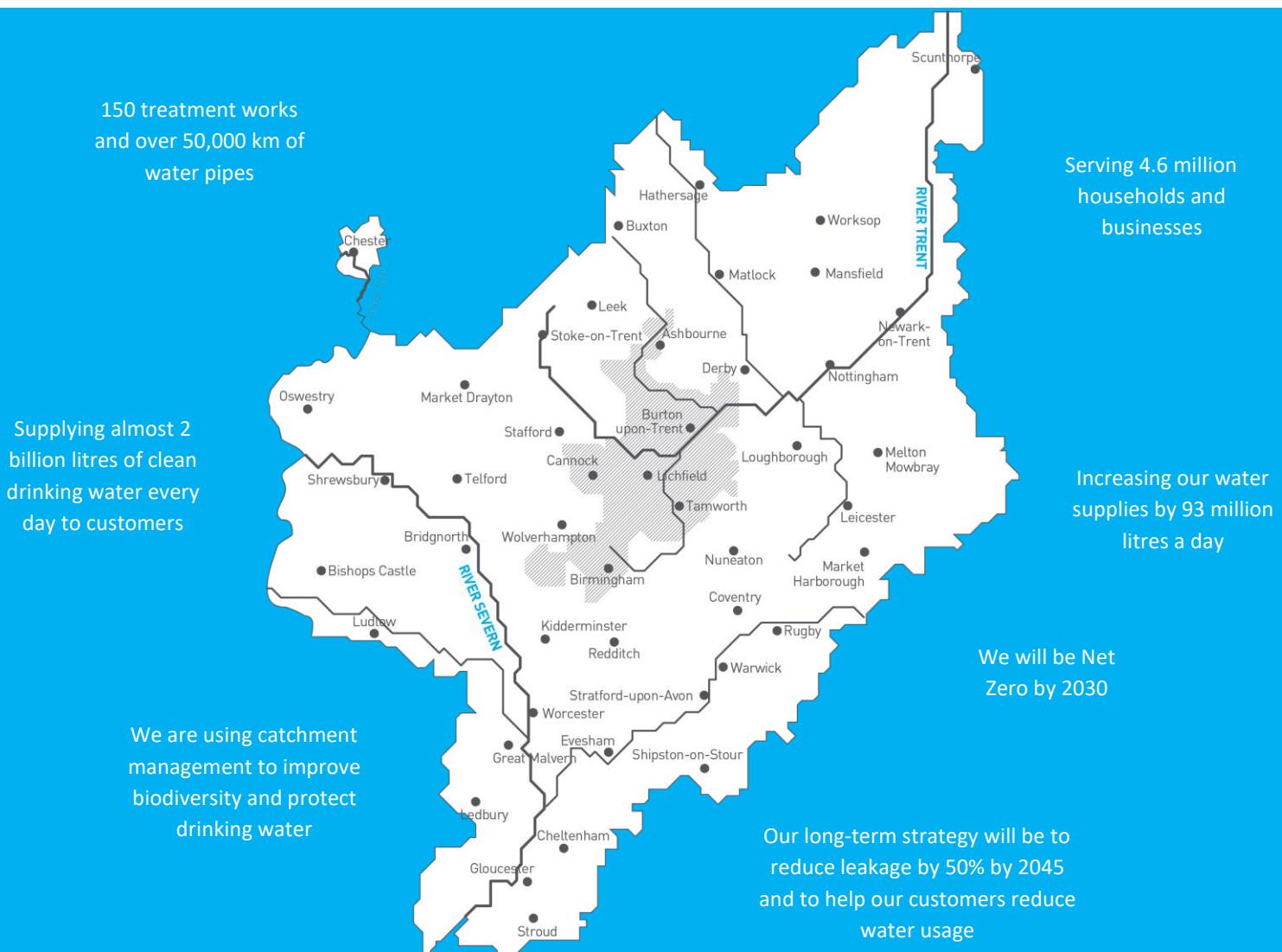
Severn Trent is one of the largest of the 11 regulated water and wastewater companies in England and Wales, covering the Heart of England from the Bristol Channel to the Humber and from Shropshire to the East Midlands. We serve 4.6 million homes and businesses.

We serve a diverse range of customers with different cultures, interests and experiences. Our region includes some of the most affluent areas of the country as well as some of the most deprived. There are more urban conurbations than any other water company's region, yet we also serve predominantly rural counties and communities. It is an area that is characterised by, and benefits from, its diversity. We are a leading water and waste company, committed to delivering high quality services to our customers, both today and in the future.

Severn Trent Water is part of Severn Trent Plc and is listed on the London Stock Exchange in the FTSE100.

The environment we live and work in is central to everything we do. We take our name from the two main rivers, the Severn and the Trent, which run through our region - two of the biggest rivers in the UK. To us, the health of rivers represents the health of the whole landscape and the communities that they exist alongside. From abstracting raw water to safely returning treated wastewater, everything we do is intrinsically linked to rivers and other water bodies in our region. We work hard to play our part in protecting them, working with others to protect and improve their catchments.

For further information about our business, please visit www.stwater.co.uk



2. A SUMMARY OF OUR WRMP

OUR CHALLENGES

Our plan describes a likely future supply/demand deficit of 290MI/d by 2040, growing to 600MI/d by 2050, if we take no action. Our previous WRMPs have not had to deal with deficits on this scale. The plan outlines a range of challenges that will impact both on supply of and demand for water:

- **Climate change** – although some uncertainty about the long-term impact remains, our models forecast longer, drier summers and more extreme rainfall events in winter.
- **Population** - the population of our region is likely to grow by a further 1.1 million people over the next 25 years, and by 2.6 million people over the next 60 years. We have forecast growth in non-household consumption linked to population growth, and to economic development in the region as part of the ‘levelling up’ ambitions of Government
- **Leakage** – currently around 21% of the water we put into supply is lost through leakage. Our leakage reduction activities reduced leakage by 62MI/d (12.5%) over the ten years between 2010 and 2020, and we are on track to reduce by a further 15% by 2025. With likely increased demand from a growing population, we need to continue this work to make sure more of our water reaches customers.
- **Value for customers** - any change that needs investment could mean higher bills for our customers. This needs to be prioritised and scheduled to manage the impact and represent best value in the long term.
- **Environmental Improvement** – reductions in the amount of water we are allowed to abstract from the environment to ensure we meet Water Framework Directive needs and future environmental destination ambition.



WHAT WE PLAN TO DO

Our best value plan

We enter the planning period in 2025 with a small surplus across our 15 water resource zones. However, due to the short-term challenges we are facing from environmental reductions that reduce water available to abstract and growth that increases demand for water, we need to invest in additional demand reduction activity and new supply options to address deficits in the first five years. These options are the first phase of our no regrets/best value plan to balance supply and demand as we face the uncertain future impacted by climate change and population growth. Increasing resilience to climate change and extreme drought, ongoing population growth impacts and further enhancement of our environmental ambition drive ongoing investments throughout the remainder of the planning period. Recognising the significant uncertainty in the long term, when developing the plan, we have assessed a broad range of plausible future scenarios. Doing this ensures the demand reductions and supply options we have selected in the early years 2025-2035 are needed across this broad range and deliver best value solutions for the long term. When developing our best value plan this was done based on a 60-year planning horizon. This period was selected to ensure alignment of planning with our Water Resources West partners, in line with regulatory expectations for regional alignment.

Problem Characterisation

Before writing our plan we have to determine the size and complexity of the supply and demand situation. We used the United Kingdom Water Industry Research (UKWIR) problem characterisation approach, which is an established technique that all water companies used to inform the development of their 2019 WRMPs. Prior to updating our plan for WRMP24 we updated our assessment to provide an initial view of the baseline for this next planning round. This used outputs from our WRMP19 and took account of expected changes in the supply demand balances up to 2025.

This analysis was a preliminary, high-level assessment to help determine the most suitable methodologies to use when creating our WRMP. For 2019 WRMPs, the problem characterisation was based on the traditional approach of planning based on the worst historic drought. For this WRMP, the review now includes the further effects of more extreme droughts. The assessment allows us to understand the level of risk and the complexity of the problem we face.

The output of our problem characterisation review has shown that overall, the company level of risk and complexity had not changed between WRMP19 and WRMP24, we are still scoring a high for both scale and complexity. Full details of our approach are included in appendix F.

Demand

Demand management is key to meeting the future supply and demand balance challenges we face. We are committed to playing our part in helping our customers reduce their use, becoming more water efficient, and helping us abstract less from the environment. This aligns to the feedback we received from customers and stakeholders that reducing demand was a priority for them. Our plan includes achieving the Government's target to reduce per capita consumption (PCC) to 110 litres per person per day by 2050, as well as the new Environmental Improvement Plan (EIP) 2023 targets to reduce distribution input by 20% by 2038 and non-household consumption reduction of 9% by 2038 and 15% by 2050. Table 2.1 below provides a summary of the key demand reduction deliverables.

Table 2.1: A summary of the demand measures we plan to implement and their expected benefits

Demand Activity	Benefit (per day)	By when
Roll out universal metering	52 million litres	2035
Reduce leakage by 50%	121million litres	2045
Deliver the Severn Trent Water Efficiency Plan	73 million litres	2050
Government Water Labelling	108 million litres	2050

Supply

At the same time, we plan to deliver a range of schemes to ensure water supplies can cope with a 1 in 500-year extreme drought by 2039 (a 0.2% chance in any year), whilst keeping pace with climate change and the requirements set out by the Environment Agency by 2050. Our plans include the increase of capacity for reservoirs and treatment plants, new reservoirs and treatment plants, transfers to areas of need and changes to import/export arrangements. Details on the individual schemes are outlined in section 5, but in summary, Table 2.2 outlines the expected benefits:

Table 2.2: A summary of the expected benefits we will achieve from the implementation of supply schemes.

Supply scheme delivery years	Benefit (per day)
AMP 8 - between 2025 and 2030	111 million litres
AMP 9 - between 2030 and 2035	42 million litres
AMP 10 - between 2035 and 2040	43 million litres
AMP 11 - between 2040 and 2045	53 million litres
AMP 12 - between 2045 to 2050	95 million litres
From 2050 to 2085	238 million litres

*AMP = Asset Management Period

To do all this we need to invest almost £10 billion over the planning period up to 2085, at an annual average of £160 million per year (Total Expenditure) between now and 2050 to deliver the new supply and demand schemes.



3. ABOUT THIS WATER RESOURCES MANAGEMENT PLAN

DEVELOPING OUR PLAN

It is a statutory requirement that every five years water companies publish a Water Resources Management Plan (WRMP); this is our fifth WRMP. This WRMP provides an update to WRMP19. It sets out our long-term strategy for the next 25 years and looks ahead to 2085 to help us understand and prepare for the future. Our plan considers potential risks to our supply due to extreme drought, climate change and changes in population and industry. The decision to extend our plan out to 2085 was made in collaboration with Water Resources West (WRW) members to ensure a consistent long-term approach as part of regional planning.

In developing this plan, we have followed the Water Resources Planning Guidelines published by the Environment Agency, Natural Resources Wales and Ofwat. Also, we have followed the Water Resources Planning Government Expectations published by Defra. We have worked on a broader regional scale, with Water Resources West, to ensure that our planning assumptions, methods, and decisions are consistent with the wider regional plan.

We began this planning cycle in 2020, seeking to better understand new and emerging future water supply/demand challenges, and re-evaluate options available to us. We have used our in-house expertise in hydrology, hydrogeology, ecology, engineering, and economics to define and quantify risks and future supply/demand scenarios.

We have also called on specialist consultants and partners to help us develop the recommendations set out in our WRMP. Throughout the development of this plan, we have shared our emerging thinking with technical specialists at the Environment Agency.

Also, through our consultation process, we have listened to and taken account of the views of our stakeholders and customers.



NEW CHALLENGES

This is the most complex Water Resources Management Plan that we have ever produced. Our customers and stakeholders rightly expect us to do more to look after water resources and the environment. At the same time, we face increasing challenges that put future water security of supply at risk. Our plan needs to be able to accommodate these known supply and demand risks and be flexible enough to cope with future uncertainties whilst also delivering value to customers and society. Finally, our plan needs to help achieve the objectives of the wider national and regional water resources strategy.

Overall, future pressures mean that our plan describes a likely future supply/demand deficit of 290Ml/d by 2040, growing to 600Ml/d by 2050. Our previous WRMPs have not had to deal with deficits on this scale.

In 2020 the Environment Agency published Meeting our Future Water Needs: A National Framework for Water Resources in which it described the long-term challenges facing water resources in England and Wales. The National Framework set out the Government's and Regulators' expectations for a new focus on national and regional water resource planning. For the first time, our statutory WRMP has been produced within the context of a wider regional water resources strategy. We are a core member of Water Resources West (WRW) and the objectives, decision making criteria and recommendations made in our WRMP24 are consistent with those in the wider regional plan.

The National Framework included requirements around topics such as future drought resilience, meeting growth in demand, water efficiency, climate change resilience, working with other sectors and delivering an improved environmental destination. These expectations from the National Framework have shaped the decisions we have taken in our plan. Our WRMP24 explains how we propose to meet the challenges described in the Environment Agency's National Framework.

Figure 3.1: A summary of the National Framework's expectations for regional planning

MUST

- take account of the National Framework and set out its potential contribution to the national need.
- be reflected in Water Resource Management Plans
- forecast supply and demand over at least 25 years and set out solutions to any deficits.
- be a single strategic plan with a preferred adaptive solution.
- take a multi-sector approach.
- look beyond regional boundaries and use technical approaches compatible with other regions.
- include enhanced environmental improvements and demand management.
- take a catchment-based approach.
- consider wider resilience benefits, including reducing flood risk, when developing options
- be open to market mechanisms.
- take into account growth ambition.
- comply with Strategic Environmental Assessment (SEA) and Habitats Regulations Assessment (HRA) legislation

SHOULD

- engage widely with interested groups.
- set out how the region will respond to drought and agree common scenarios for drought actions.
- join up with drainage and wastewater management plans.
- seek to improve resilience to events other than drought, particularly floods.
- look ahead 50 years or more

COULD

- contain all the detailed information required for Water Resource Management Plan
- contain all the detailed information required for Drought Plans

One of the most significant challenges we face in this plan is how we protect the water environment against the impacts of population growth and future climate change. In our WRMP19 we described for the first time how the legal requirements of the Water Framework Directive meant we needed to make significant changes to our water supply system to prevent deterioration of the water environment. In this latest WRMP24, we describe our improved understanding of the investment needed to meet this challenge by the 2030s, along with the further steps that will be needed by 2050 to achieve the environmental destination ambitions described in the Environment Agency's National Framework.

As well as protecting and improving the future water environment, the solutions described in our plan will help us to achieve resilience to 1 in 500-year drought events, improve supply resilience to climate change, drive down leakage, reduce non-household consumption by 15% by 2050 and help reduce household water consumption to the government's target of 110 litres per head per day by 2050.

Whilst we recognise that the precise magnitude and timing of the different supply/demand pressures is uncertain, our plan recommends a number of low/no-regret decisions that we can be confident are needed. Our plan also describes alternative, potential future pathways that could unfold over time and shows what different decisions we might need to make as a result. Finally, this plan considers the wider environmental and social value that our different options could provide and how these have influenced our decisions.



WATER RESOURCES WEST (WRW)

The Environment Agency's National Framework laid out the scale of the water resources challenge facing England and Wales. This set the expectation that water companies work together in regional groups (see Figure 3.2) to develop a set of cohesive plans which identify the best options to meet the challenges we are facing into, whilst delivering best value for the environment and society. We are a core member of WRW, and we have worked closely with the other core members – Dŵr Cymru Welsh Water, Hafren Dyfrdwy, United Utilities, and South Staffs Water to develop a plan for our region.

Within WRW we have built a detailed bottom-up plan for our region. There is direct alignment between the regional plan and the constituent plans produced by each member.

There are many interactions between the WRW region and other regions as well as other users of the water environment.

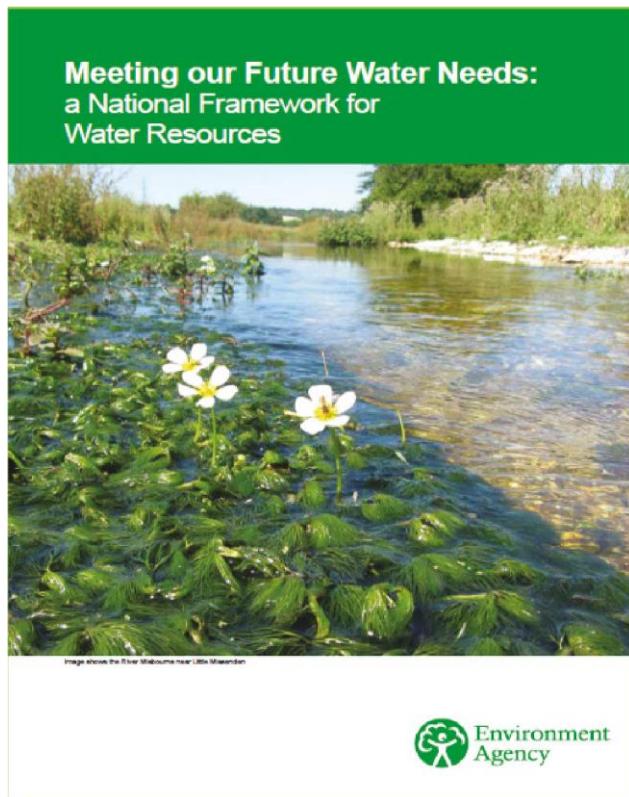


Figure 3.2: The five regional water resources areas



Alongside core members, WRW also has associate members who provide input into the development of the plan. These are:

- Affinity Water
 - Bristol Water
 - British Ceramic Confederation
 - Canal and River Trust (The Trust)
 - Confederation of Paper Industries
 - Energy UK
 - Horticultural Trades Association
 - Independent Networks Association
 - Independent Water Networks Limited
 - Mineral Products Association
 - MUA Group
 - National Farmers Union (NFU)
 - Thames Water
 - Waterlevel Limited
 - Wessex Water

Environment Agency (EA), Natural Resources Wales (NRW), Welsh Government, Natural England (NE), the Department for Environment, Food & Rural Affairs (DEFRA) and the Regulators Alliance for Progressing Infrastructure Development (RAPID) also provide advisory support to WRW.

Working with its core and associate members and our regulators, WRW has been able to understand more about the current and future water needs of neighbouring water companies and other sectors in the region. This partnership working allowed us to develop potential future water resource options, both for our preferred plan and alternative pathways. We continue to work with our WRW partners to explore future opportunities and potential collaborative water resource schemes.

The WRW plan goes beyond public water supply planning and has developed an understanding of how much water other sectors in our region are likely to need in future. Although these non-public water supply (non-PWS) needs are not a specific component of our plan, as a member of WRW we have assessed the future non-PWS requirements, including direct engagement with representatives of the non-PWS sectors including CRT, NFU and the power sector. We are committed to supporting the regional planning process to help address non-PWS needs, however Government and Regulators will need to address appropriate funding mechanisms as regulated public water supply companies cannot cross subsidise the non-PWS sector.

More details are available in the regional plan (found at waterresourceswest.co.uk) which outlines the region wide strategy for ensuring long term sustainable water supplies for all sectors. The key elements of the Water Resources West strategy are shown in Figure 3.3.

Figure 3.3: Summary of Water Resources West's long-term strategy

Our strategy for sustainable water supplies



We are also core members of the River Severn and River Trent Working Groups and Modelling Groups. Here we work alongside water companies (United Utilities, South Staffordshire Water, Bristol Water, Thames Water, and Anglian Water), regulators (EA, NRW, Ofwat, and NE) and other stakeholders including the River Severn Partnership and the Canal and River Trust to develop a holistic view of these important river catchments and seize opportunities to drive improvement through collaboration. The working groups are a useful information and knowledge sharing forum, with information about work programmes (such as the Severn to Thames Transfer proposal, drought monitoring and drought plan updates and the River Severn Enterprise scheme) being discussed on a regular basis. These groups also provide a level of assurance and validation of data and methodologies. For example, the River Severn Modelling Group carried out a model parameter and assumptions alignment project to ensure that all companies are using the same assumptions for shared resources, like reservoir operational rules, River Severn regulation rules and abstraction assumptions.

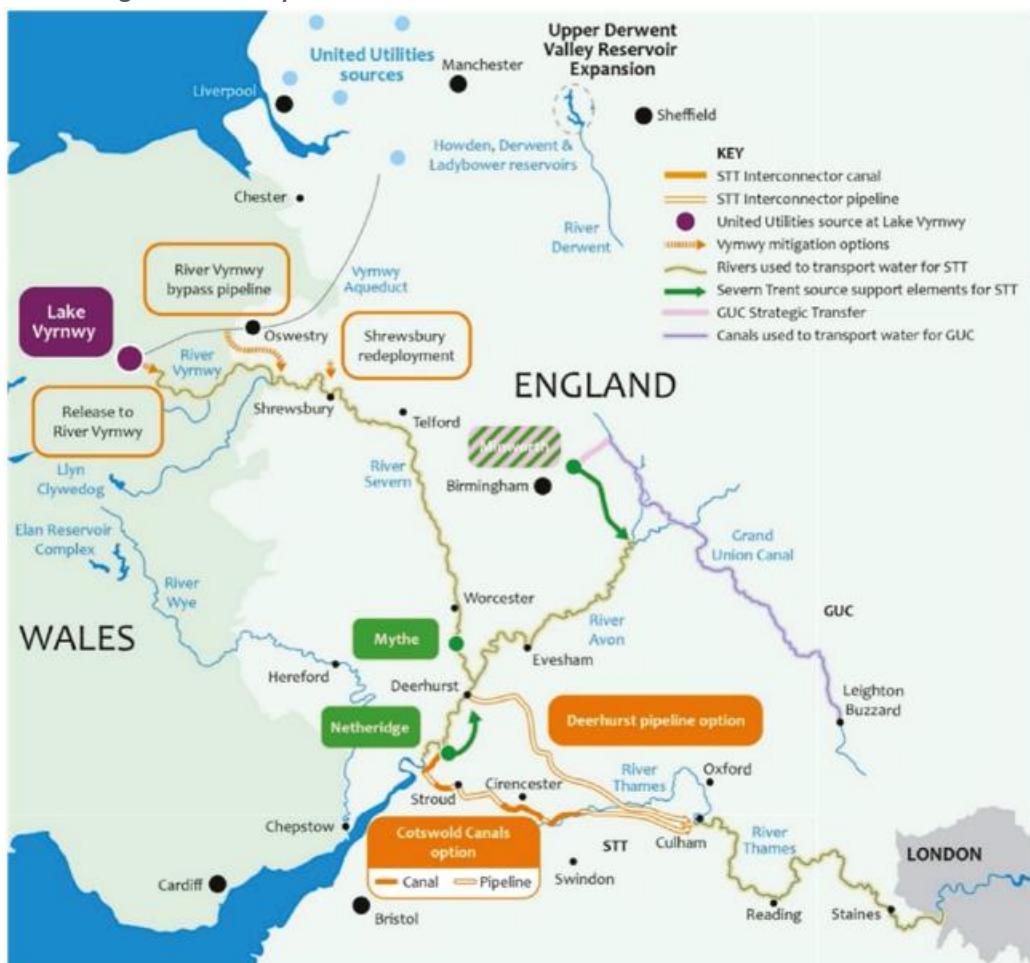
STRATEGIC RESOURCE OPTIONS

In 2019, Ofwat's final determination of price limits included an allowance for expenditure to progress the development of strategic regional water resource solutions. As a result, a number of projects were initiated to gather evidence on the feasibility of delivering Strategic Resource Options (SROs) that could benefit national and regional long term water security of supply. The Regulators' Alliance for Progressing Infrastructure Development (RAPID) was established in 2019 as a partnership made up of the three water regulators – Ofwat, EA and the Drinking Water Inspectorate (DWI) – to oversee the delivery of the SRO projects.

For our WRMP24 we have considered the interactions and dependencies between the options considered within our plan and these SROs. Due to our geography, Severn Trent, and Water Resources West play an important role in several of these potential SROs, so we need to understand how they would interact with our own needs.

The SROs that potentially would interact directly with our WRMP24 are the Grand Union Canal (GUC) transfer and the elements that make up the Severn to Thames Transfer, both of which would transfer water to Water Resources South East (WRSE), and the Upper Derwent Valley Reservoir Expansion (UDVRE) which would support transfers to Water Resources North. These are illustrated in Figure 3.4.

Figure 3.4: The Strategic Resource Options that interact with Water Resources West and Severn Trent



Ofwat, RAPID, EA, NRW and Defra have developed a governance structure to coordinate water resources planning and SRO decisions and provide a pathway through to Price Review 2024 (PR24) business plans. The WRW Regional Plan and our WRMP24 have been prepared in parallel to demonstrate consistent needs and evidence for long term investment. WRW and other regions have been working closely with RAPID and National EA to reconcile the emerging regional needs and demonstrate a coherent case for SROs. The outputs from this reconciliation form important evidence to support the recommendations in our plan and to justify RAPID's Gate 2 decisions on the SRO projects.

You can find out more details about the SROs that we're directly involved with and view the most recently published gate reports on our website at severntrent.com/sro.

Grand Union Canal

The GUC SRO is being selected in Affinity Water's preferred plan. Currently requiring water into supply in 2031/32, this scheme uses up to 115Ml/d of recycled water from our Minworth treatment works, which will undergo tertiary treatment before being pumped via a pipeline and discharged into the canal network at a location close to Atherstone. The canal will undergo a series of engineering improvements to allow water to be moved south through the network to be abstracted at Leighton Buzzard, where it will undergo further treatment to drinking water standard and be pumped into Affinity Water's network. Extensive environmental investigations and modelling have been completed on both the river system downstream of the current Minworth discharge (River Tame, River Trent and Humber Estuary) as well as on the canal network the water will be transferred through, looking at both mitigating any potential impacts as well as investigating enhancements for nature and societal gain. We have started to engage with interested parties, and this engagement will ramp up over the next few years. The engagement to date with regulators and canal users about the project has resulted in environmentally beneficial changes to the scheme, such as moving the Affinity Water abstraction location north so the water is not transferred over Tring Summit. This means there will be no interaction between the transfer and the internationally important habitat of the Chalk Streams in the southeast of England. Although this scheme does not provide a water resource benefit for Severn Trent customers it is included in our planning tables to help regulators to track the transfers between water companies and regions. There is a separate feasible option included in our tables for use of recycled water that could benefit our area but it is not selected in the preferred plan.



Upper Derwent Valley

We received many comments from a wide range of consultees regarding the proposed UDVRE SRO. Key concerns raised focused on the potential impacts on protected areas, and compliance with SEA, HRA and WFD requirements. In our draft plan the scheme was not needed until at least 2050.

We have now removed the reservoir expansion component of this SRO from our preferred plan. This part of the scheme is replaced by a combination of leakage, customer demand management and accelerated supply options from later in our preferred plan time horizon. The revised Gate Two submission for an UDVRE solution on the basis of the Yorkshire Backfill component of the SRO will now be after the WRMPs for Severn Trent and Yorkshire Water have been published. As we develop our next plan (WRMP29) we will consider alternatives to the UDVRE scheme that sit outside the National Park as part of our options appraisal, and if appropriate assess these options for our WRMP29 plan.

Severn to Thames Transfer

Through the regional reconciliation process that continued post submission of our draft plan, the Severn to Thames Transfer (STT) has been removed from the preferred plan and is now included in one of the alternative pathways. The section below sets out the joint company and regional statement on the scheme.

STT represents a strategic resource option that facilitates the transfer of water from the River Severn to the River Thames. This would be supported by several sources of water¹ from United Utilities and Severn Trent.

During the development of the draft regional plans and Water Resource Management Plans, STT was selected as part of the WRSE regional solution, in conjunction with other schemes, in 2050. This was also reflected in WRW's plans.

Whilst STT featured in both regions' draft preferred plans, a series of sensitivity tests at the time showed that the STT could be selected as early as 2039, if the Southeast Strategic Reservoir Option (SESRO) could not be developed, or not at all if government water efficiency policies resulted in a lower demand forecast due to increased water efficiency.

In March 2023 the regional reconciliation process began its third round. At this time none of the regions had finalised a preferred revised regional plan. Therefore, sensitivity runs were undertaken to explore what might happen under certain scenarios. This scenario modelling used the updated STT data, but some other information in the WRSE model was based on the draft plan.

The scenario testing approach confirmed that if the WRSE companies met the 110 l/p/d PCC target by 2050 then STT was not selected in the reported pathway (preferred plan). Sensitivity tests also confirmed the need for STT in scenarios without SESRO or with government water efficiency interventions not reducing demand to the levels anticipated. Therefore, the need for STT inclusion in an adaptive plan was confirmed. Given that the revised draft plan was still under development for WRSE, but we knew that the revised regional plan would seek to achieve the 110 l/p/d PCC guidance target, the more likely scenario was that STT would not be required in the preferred plan for WRSE or WRW. This was the agreed outcome of reconciliation for inclusion in the revised draft WRMPs, which includes alternative pathways to deal with potential changes.

Although the water companies are working toward mitigating those risks through their plans, they are influenced by factors outside of the control of the companies and therefore have a reasonable likelihood of occurring. The alternative pathways recognise different potential outcomes. In either case, there is a need to progress development of the STT system² in the next 5 years so it can be delivered by 2039 if required.

¹ The North West Transfer enabling use of Vyrnwy Reservoir, and recycling water from Minworth and Netheridge.

² STT System includes the STT and the sources that feed water to the STT, namely Severn Trent Sources (Netheridge), Minworth and the North West Transfer. Changes to the flow regime in the Severn catchment due to releases, interactions with the Severn Regulation Scheme, a bypass pipeline for the Afon Vyrnwy and system operation are within the scope of the STT project.

As the regional plans continue to be developed, the risks associated with the promotion of certain schemes or delivering the water efficiency targets, set out in the Environment Improvement Plan, remain. Both regions have developed a series of adaptive regional plans to help offset some of this risk.

The adaptive regional plans consider three scenarios:

- Benign scenario in which schemes and assumed savings from water demand reduction measures are delivered (this is aligned to the reported pathway/preferred plan),
- A short-term adverse scenario in which preferred supply options aren't delivered and STT is then required to be developed and operational by 2039/40; and
- A long-term adverse scenario in which the projected demand management savings do not materialise and additional water from STT is required by 2050.

Through this approach, both regions would monitor the delivery of the schemes and benefits of their plans to understand if their plans are still on track or whether they need to adapt to one of the scenarios above.

For the regional plans to remain flexible and adaptive, it is critical that key schemes are progressed in a timely manner. In the case of STT and the potential for it to play a part in the short-term adverse scenario, this would require development of the scheme to continue over the next AMP period (2025-2030) and through the next gates to provide confidence that the scheme could be utilised when required. Proposed milestones are under development and in discussion with RAPID to be reflected in future gate submissions.

Therefore, both regions and relevant companies are promoting the continued development of the STT system in their WRMPs, Regional Plans and business plans to provide confidence to regulators and the Secretary of State that their plans are robust and can adapt to meet their statutory duties in the future. This jointly agreed text demonstrates alignment of the companies and regions on this need to solve national water resources risks identified in the National Framework.

Included within the potential alternative pathway options where STT may be selected is the potential use of the 75Ml/d which features in the Severn Trent alternative pathways. Up to 180Ml/d is available as a raw transfer as part of the potential Severn to Thames Transfer SRO scheme, which includes the 75Ml/d to be used by Severn Trent should we transition to an alternative pathway that requires this transfer.

Future SRO development

We continue to work to identify potential SRO schemes which could support our supply demand balance and/or the National Framework for Water Resources. The delivery of these schemes is likely to be beyond AMP8 and would therefore form part of our WRMP29 studies if supported by RAPID.

If we identify a new SRO which we believe could offer a better solution for customers and the environment, we will discuss this with RAPID. If considered to present better solution than those within our current plan, we will work with our regulators and stakeholders to agree a change control mechanism.

New SROs in our PR24 Final Determination

The Final Determination is set by Ofwat. It is the confirmation of our business plan which details the maximum customer bill increases for the period 2025-2030, and the associated improvements and investment we will make to our assets to support our customers and protect the environment. Our PR24 Final Determination included the addition of three new SROs to investigate: Rudyard Reservoir Augmentation scheme, Nottinghamshire Mine Water Scheme and West Midlands Raw Water Storage.

Rudyard Reservoir Augmentation

The Rudyard Reservoir Augmentation Strategic Resource Option (RRA SRO) looks to take an innovative approach to water management in the North Staffordshire's Water Resource Zone. We have created a long list of 27 possible schemes, some of which, working in conjunction with each other, will enable us to manage water availability to our customers and also support the canal network. As part of the wider project, we aim to provide a number of environmental benefits, one of which is the possibility of alleviating flood risk, in particular in the town of Leek, where flooding generally occurs annually. Working in conjunction with the Canal and River Trust (The Trust), we are currently taking the 27 schemes through feasibility to create a short list for further investigations. The project also aims to optimise The Trust's existing infrastructure to store and transport water, including improving feeder channels and canals, reservoirs and locks. This work will contribute to a lower carbon impact, improve flooding and reduce water loss through seepage. The project initially solely looked at augmenting Tittesworth WTW supply with water from the Trust's Rudyard reservoir, but through collaboration since 2022 we have identified these 26 further options which the SRO will be investigating. Following this Final Determination allowance from Ofwat we will be working through RAPID's gated process to further understand and develop the existing Rudyard transfer option as one of the components of the Rudyard Reservoir Augmentation SRO. We have completed the first phase of our high-level feasibility study for this new SRO, including Deployable Output benefit modelling and expect to be able to deliver the 6 MI/d zonal benefit assessed for the Rudyard transfer option. We are about to commence the next phase of feasibility to consider additional raw water sources and transfer options to ensure we identify the best value options for inclusion in our Gate 1 submission to RAPID.

Nottinghamshire Mine Water

The Nottinghamshire Mine Water (NMW) Strategic Resource Option (SRO) aims to provide a new water supply for the East Midlands and South Yorkshire. This project is a collaborative effort between Severn Trent (ST), Yorkshire Water (YW), and the Mining Remediation Authority (MRA). The primary sources of water for this scheme are the Hartington-Creswell-Langwith (HCL) Mine Water Block and other deep legacy coal workings in the Nottinghamshire, Derbyshire, and South Yorkshire regions. The MRA is currently conducting feasibility studies to determine the best methods for managing the emerging risk of saline water rise causing aquifer contamination and we are working with them to investigate abstracting water from these now defunct coal mines and treating the water to potable standard. The project involves several phases. Initially, the focus is on utilising the existing Hartington abstraction system (shallow mine water), which currently discharges into the River Rother. This system will be enhanced to include treatment for drinking water and distribution. In later phases, the project will involve the abstraction and treatment of saline mine water from deeper coal workings. This will require the development of inland treatment plants capable of handling the high salinity levels. The treated water will be transferred through pipelines to the ST or YW distribution networks. Brine management systems will also be implemented to ensure the safe disposal of treatment by-products.

West Midlands Raw Water Storage

The West Midland Raw Water Storage (WMRWS) solution involves converting a quarry, near Shrewsbury and the River Severn, into a pumped raw water storage reservoir. This project aims to enhance water supply resilience by utilising an existing quarry site for water storage and management, and to mitigate some of the downstream flood risks on the River Severn. The primary source of water is the River Severn. Water will be abstracted from the river during periods of high flow, with the abstraction process carefully managed to ensure compliance with environmental regulations and to protect the river's health. A new Water Treatment Works (WTW) will be constructed close to the storage reservoir to treat the raw water to potable water standards. Treated water will be distributed to the local supply area, specifically the Shelton Water Resource Zone (WRZ), with new pipelines connecting the WTW to the Shrewsbury supply network and the Wrekin Distribution Service Reservoir (DSR) near Telford.

GOVERNMENT AND REGULATORS' EXPECTATIONS

A number of elements of the Water Resources Planning Guidelines have changed since our last WRMP was produced. Key changes include:

- **Regional Planning** – the new National Framework lays out the scale of the upcoming water resources challenge and sets the expectation that water companies work together in regional groups to develop a set of cohesive plans which identify the best options to meet the challenges we are facing, whilst delivering best value for the environment and society.
- **Drought Resilience and climate change** – companies are now expected to plan for resilience to a 1 in 500-year drought. We are also required to assess a range of climate change scenarios to test the robustness of our water supply system.
- **Improving the Environment** – companies are expected to include an ambitious environmental destination target and explain how they intend to achieve this including incorporating new guidance on licence capping.
- **Best Value Plan** – previously companies were expected to create their plans at the least cost for their customers. However, they are now expected to build a plan that is best value, taking into consideration a number of different criteria including environmental, economic and wellbeing costs as well as financial costs, including natural accounting principles.
- **Longer planning period** – the minimum statutory planning period remains 25 years, however, companies are now expected to look ahead further into the future. At a regional plan level companies are looking ahead to 2085. We have aligned our WRMP tables to cover this period.

This document has been developed in line with the expectations set out in relevant Government and Regulatory guidance and policies. As part of the WRMP planning process, we have received policy and technical guidance from Defra and our regulators including the DWI, EA and Ofwat. This guidance covers a variety of statutory requirements, including topics such as supply resilience, drinking water protection and environmental protection. The guidance also sets out policy expectations and performance challenges in areas such as leakage, demand management and Environmental Destination.

The guidance and policies we have followed includes, but is not limited to:

- WRP Government Expectations (May 2022)
- The Water Resources Planning Guidelines (December 2021) and associated instruction documents.
- The Government's 25 Year Environment Plan (October 2021)
- The Water Company Drought Plan Guideline (April 2020)
- Meeting our future water needs: a national framework for water resources (May 2020)

OUR DECISION-MAKING APPROACH

Our WRMP recommends a programme of short, medium and long-term investment in leakage reduction, demand management, water metering and supply improvements. This recommended programme reflects our current understanding of the future water supply and demand challenges facing our region.

The proposed solutions include low regret solutions that we can start with confidence in the next five years. The plan also includes proposals for the next ten years and beyond which are flexible and do not require investment decisions to be made before our strategy is updated in our next WRMP.

Overall, the proposals set out in our WRMP represent a sustainable and affordable balance of demand management and supply improvement measures that mean we can meet demand for water from our current and future

customers over the next 25 years and beyond. Our no/low regret supply/demand investment recommendations for the near term are accompanied by an extensive environmental investigation programme to better understand how to achieve the environmental destination goals in a sustainable and affordable way that does not put security of public water supplies at risk.

Overall, our approach gives us confidence about the steps needed to secure supplies over the next 25 years whilst also highlighting where we need to focus our activities to reduce the uncertainties around the very long-term supply/demand balance. Our decision-making approach follows the principles set out in the EA's Water Resources Management Planning Guidelines.

Figure 3.5: How the stages of our approach correspond to those principles.

EA's WRMP Guidelines	STW's Best Value Planning Tools		
Set Best Value Planning Objectives	Policy Expectations	SEA Scoping	Consultations
Develop Metrics	Value stream		
Decision Making Approach	WISDM	DMU	Value stream
Identify Least Cost Plan Baseline	WISDM		DMU
Appraise & Compare Programmes	DMU Pathways		
Engagement	Internal: Board	WRW Consultations	STW Consultations
Assess Adaptive Plan Choices	DMU	SEA, WFD, HRA etc	Value stream
Test the Plan	SSEA, WFD, HRA etc		DMU
Justify the preferred plan	WRMP		Regional Plan

In our decision making we have taken account of the costs, supply benefits, environmental impacts and social impacts of the different options we have available to us. Our decision making models are an evolution of the investment optimisation tools we used for WRMP19/PR19 and for our Green Recovery investment plans.

Throughout the WRMP24 process we have provided snapshots of the environmental appraisals of our options at draft, revised draft for both WRW (environmental metrics) and our own WRMP. We have updated our Environmental Report to include the latest environmental information. This incorporates our current understanding of scheme design and delivery programme for our preferred plan and alternative pathways.

The final version of the Environmental Report is published alongside this final WRMP. It reflects the best available option information at the time of assessment and incorporates the in-combination/cumulative assessment of our options alongside those in the wider regional plan as well as the neighbouring water companies plans. The environmental report accompanies the final WRMP24 and consists of the following documents:

- Strategic Environmental Assessment (SEA)
- Habitats Regulations Assessment (HRA)
- Water Framework Directive (WFD)
- Natural Capital Assessment (NCA)
- Biodiversity Net Gain (BNG)
- Invasive Non-Native Species (INNS)

AFFORDABILITY

We will need significant investment over the next 25 years and beyond to meet the challenges described in this plan. It is important that we consider the impacts of this investment on our customers' bills and how this could affect the affordability of achieving the goals described in our plan.

The WRMP forms part of our broader PR24 planning and the impacts of investment and future affordability of our WRMP in the context of these broader plans will be considered. A best value plan has been generated as a result of this process. Total bill impacts are assessed through the PR24 process, with £680 million of additional investment in the next five years as part of best value plan to balance supply and demand.

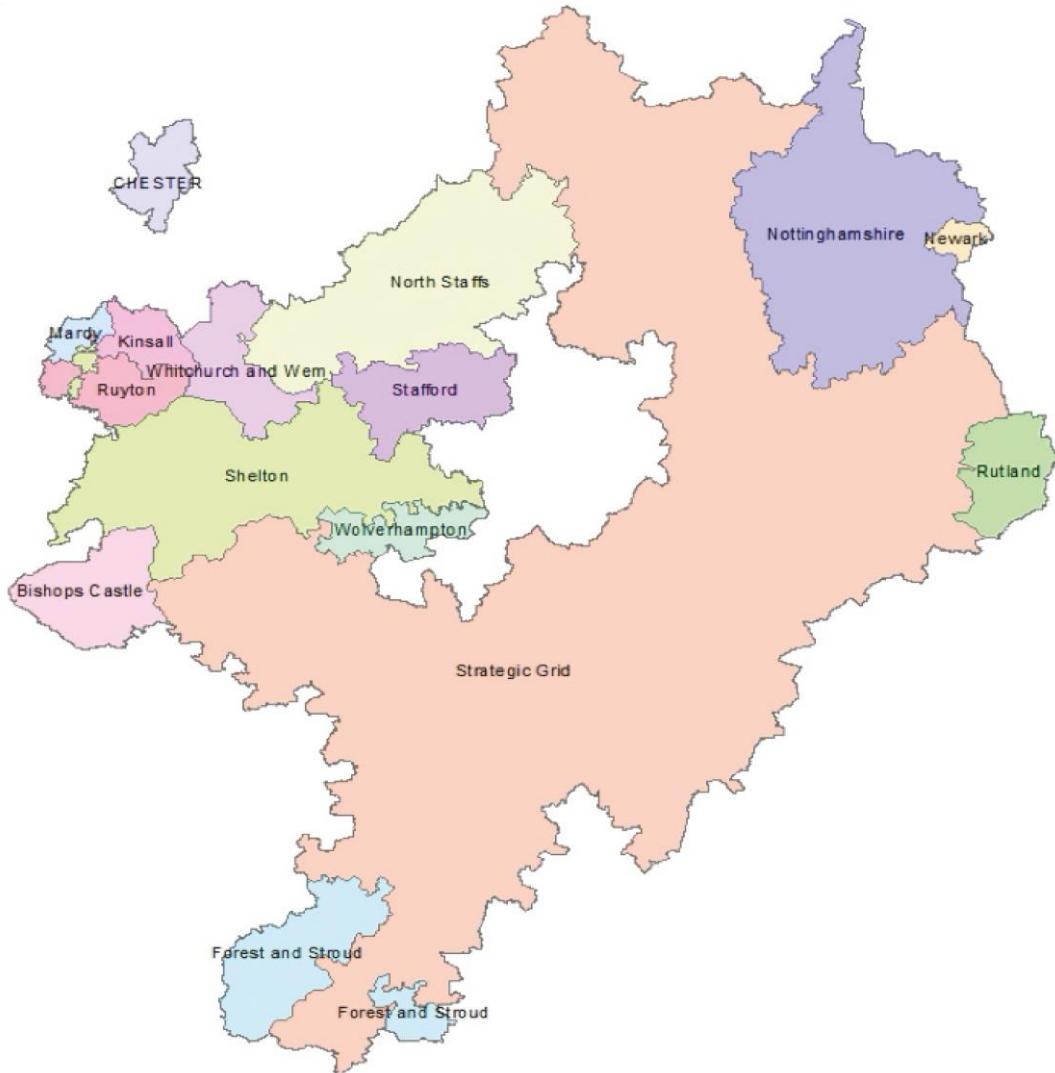
OUR WATER RESOURCE ZONES

For the purposes of water resources planning, we divide the company supply area up into 15 Water Resource Zones (WRZs). These zones vary widely in scale, from the Strategic Grid zone which supplies the majority of our customers, to the small zones of Mardy and Bishops Castle which supply much smaller areas. We have followed EA guidance in determining our WRZs; each zone is determined by the likely service impacts should a risk (for example raw water scarcity) be realised. However, it is possible under certain circumstances to be able to subdivide these areas, into smaller units of operation. In light of our experiences in 2022 we have reviewed our zone boundaries. As agreed with the EA this work was completed post submission of our WRMP with the initial view of any revision to our WRZs shared with the EA at the end 2024 and finalised in early 2025. We will report on implementation and tracking of the new resource zones in our WRMP Annual Review reporting.

Our zones face different challenges, with some requiring significant investment in the long term to ensure secure supplies, whilst others will need minimal investment other than to maintain the current assets and infrastructure. These future pressures and our plans to ensure sufficient water supplies for each water resource zone are explained in this WRMP.



Figure 3.6: Our water resource zones



CHANGES SINCE WRMP19

Our last WRMP was published in 2019, and whilst the over-arching challenge of maintaining a secure supply of high-quality water to our customers remains the same, there have been some significant changes in our working environment and expectations since then. A summary of the material changes since WRMP19 was published is outlined below.

Covid and changing demand for water

The COVID-19 pandemic has affected recent demand for water and potentially will have longer-term impacts on consumption patterns. In March 2020 people throughout the UK were told they must stay at home and were only allowed to leave their homes for a small number of purposes to control the spread of COVID-19 from the novel coronavirus SARS-CoV-2. This was the start of a lengthy period of lockdown through to July 2020, followed by easing of lockdown measures and subsequent phases of lockdowns and restrictions to control COVID-19 spread through the remainder of the year. The lockdown led to significant changes to customers' water using behaviour and demand patterns, which when combined with the hot and dry weather of summer 2020 resulted in some of the highest peaks

in water demand that we have ever seen. Factors causing this increase include the health advice on hand washing, more people staying at home as we moved into the lockdown period, home schooling and home working.

Following the easing of lockdown and subsequent return of a degree of normality, household consumption has reduced from the peaks of 2020/21 lockdown levels. Household consumption is now similar to pre-pandemic levels, though above the targeted levels we forecast in WRMP19. Uncertainty remains over what a ‘new normal’ looks like with regard to COVID-19 impact on water consumption and this presents a challenge for the future. We have developed this plan against this COVID-19 uncertainty and our successful leakage and demand management record, and household metering programme of AMP7 gives us a strong platform on which to build the ambitious demand reductions set out in this latest plan.

Hot and dry weather

The summer of 2022 was exceptionally hot and dry and as a result we initiated the actions described in our Drought Plan to protect storage at our strategic reservoirs. For example, the Upper Derwent Valley experienced its driest five-month period since 1891 which led to reservoir storage dropping lower than would be normally expected.

Full details of the effects of the 2022 drought and how it’s influenced our Drought Plan and WRMP can be found in appendix I.

In summary, our response to the exceptional hot, dry weather was that we took proactive steps to reduce water demand and to protect our sources of supply:

- We accelerated our leakage activities and increased the number of leaks detected and repaired.
- We increased our proactive customer communications to influence water use behaviour. Between May and September 2022, we sent out over 10 million items of direct text and email communication to customers with water efficiency and hot weather messaging.
- We reconfigured our supply networks to allow us to minimise the demand on our Derwent Valley and Tittesworth reservoirs and so protect reservoir storage.
- Based on our ‘Our Water’ customer research, we ran a comprehensive, multi-channel customer campaign to help our customers link energy to water use around the home, highlighting how changing water habits can lead to energy and monetary savings. We ran television, radio, and social media campaigns, worked with influencers with boosted and hyperlocal activity to engage customers directly, as well as other organisations, local community groups and charities, to maximise our reach.
- We were also present on the ground in our communities, employing a team of local people to become water saving champions. Our champions went door-to-door, talking to our customers in high demand areas, offering advice on how to save water, energy and as a result, money. The team also provided additional home water efficiency checks, signposting customers to our website – stwater.co.uk – where they could find free products and advice on leaks in the home.
- Our education team contacted all schools in water stressed Leicestershire and Derbyshire areas, with the offer of assemblies and workshops – and a free water butt for the school – and we provided ‘pop ups’ in the community to talk to customers about our free products and how they could save water and money.
- As part of our research, we were able to use our Green Recovery smart meter pilot in Coventry and Warwickshire to find and fix leaks more effectively as the ground lost moisture and began to move.

As a result of these efforts, we were able to reduce output from our Derwent Valley water treatment works to a new low (42% reduction in output) and periodically turn off our treatment works in North Staffordshire.

Through our collective effort on the network and the support of our customers to our requests to use water wisely, water demand by September 2022 had been driven to 6% lower than the average we had seen in the four preceding summers.

Our experience of 2022 has very much demonstrated the flexibility and resilience of the supply networks that make up our WRZs.

Green Recovery

Our region's economy was one of the hardest affected by COVID-19 and, as a responsible business in our region, we proposed an ambitious package of investments aimed at delivering long-term, sustainable benefits for current and future generations in our region, through improving the environment and creating jobs.

Our customers helped us to shape and develop the proposals and we were delighted and encouraged by their positive engagement and feedback. In July 2021, Ofwat confirmed we could invest an additional £566 million (2017/18 prices) in our ambitious Green Recovery programme providing a great opportunity to support our Environmental, Social and Governance (ESG) ambitions. We were thrilled with this outcome and all our Green Recovery projects are now progressing at pace with key suppliers engaged. The benefits these schemes will create for our customers are wide-ranging:

- Improving more than 50 km of rivers to create bathing quality stretches of water on the Rivers Leam and Teme will provide more leisure opportunities, improve wellbeing, and deliver environmental benefits, including enhanced biodiversity and healthier aquatic life.
- Our £76 million Green Recovery project in Mansfield is seeing us install thousands of sustainable urban drainage schemes including rain gardens, retention ponds and swales, creating a greener, cleaner environment across the town. Not only will these interventions assist with flood alleviation in Mansfield, they will also deliver wonderful nature-based amenities for local communities to enjoy.
- Our supply pipes project has been really challenging so far in terms of achieving planned job numbers, but we continue to learn a huge amount and adapt our approach accordingly.

On top of the long-term benefits for customers and the environment, these investments will directly create jobs in the Midlands at a time when employment, and getting people back into work, is vital for our region. We will be recruiting and training local people, using the brilliant facilities at our Severn Trent Academy, to improve skills across our region. In addition, through our Societal Strategy, we will be helping tackle the underlying causes of poverty across the Midlands in a landmark scheme designed to help up to 100,000 people find employment, while supporting them to reach their potential.

Our Green Recovery investment includes schemes that will improve our water supply/demand balance and the water environment. Our Green Recovery projects include:

Lowering Water Consumption

The goal is to raise awareness of water efficiency, making customers more conscious of the environmental impact of their usage and of unchecked leaks. We will help customers save water and save money on their water bills and we can target high volume users during periods of high demand, reducing interruptions for all customers. We will also improve our data capture, giving us a better understanding of our water balance. We will achieve this by rolling out a large-scale trial of over 157,000 smart water meters across our network, throughout Coventry and Warwickshire. This includes over 66,000 new meters and 91,000 replacement meters. These new smart meters will help us reduce peak-time demand as customers use water more efficiently, while also helping us reduce leakage by enough to supply a town with a population over 22,000.

More water for more customers

The goal is to increase water supplies by up to 93Ml/d – enough to serve a city the size of Derby. We will do this with a reduced carbon impact, and share our approach with companies in the sector, supporting our and the water sector's aim to be net zero by 2030. The additional water supply will increase our resilience to hotter, drier summers, securing water resources for future generations. Our work will also increase the biodiversity of 46 hectares of habitat at our

Witches Oak site, and trial reduced chemical treatment in the water process. The benefits of this scheme are included within our baseline supply demand balance from 2025.

The project is an example of innovative water rights trading between sectors as it will utilise an abstraction licence we have purchased from a decommissioned power station at Rugeley and we will build a new water treatment works for this source of water. We will construct a ceramic membrane plant; a first for us.

Rivers safer for swimming

This project will make stretches of the River Leam and River Teme healthy enough to swim in. We will pass on what we learn to other organisations, as part of our efforts to understand what it takes to achieve bathing quality rivers and to ensure the UK's rivers can achieve 'good ecological status'. As a result, we will create more leisure opportunities, improve community wellbeing and deliver environmental benefits, including enhanced biodiversity and healthier aquatic life.

The approach is to engage with and help other parties make positive change in the catchment, e.g. working with farmers to prevent pollution getting into rivers. We will develop new ways of communicating with river users so they understand water quality in real time. We will also install ozone recycled water disinfection at three sewage treatment works and build new storage and sewer capacity to help us reduce the environmental impact of around 25 storm overflows.

While we do not own our region's rivers, we have an important role to play in improving river health. That means significant innovation and investment over the next ten years. We will use state-of-the art systems, materials and processes, creating blueprints for a new water future, one that is leading the way for the whole UK water industry. With our nearest coastline being at least 80 miles away, our communities will benefit directly from our bathing rivers project. Our project will generate new opportunities for people to enjoy the outdoors and connect with the environment. This exciting project is the first big step in creating bathing rivers in our region and advancing our plans to 'Get River Positive' so that our communities and customers can look forward to enjoying our rivers safely in the future.

We have already deployed over 25 monitors that track a range of river parameters. We are looking to be innovative in this space, so we are trialling two new types of monitors in addition to a more established type. This will give us great insight into which are the most accurate and cost-effective monitoring solutions.

Faster environmental improvements

Through the Water Industry National Environment Plan (WINEP) project, we are accelerating our environmental commitment by improving 500km of rivers, five years earlier than planned. We will do this by fulfilling our Water Framework Directive (WFD) statutory obligations more quickly and accelerating improvements to storm overflows. In addition, we will see aquatic wildlife thrive.

We will initiate 34 additional phosphate-removal projects, extra monitoring and investigative measures at 150 sewer overflows and accelerate improvements at 100 overflows. We will upgrade chemical dosing and invest in new technologies to enhance the removal of tertiary solids. Where possible, we will use chemical-free methods, such as enhanced biological phosphate removal and, in some cases, constructed wetlands. Other measures will include raising weir heights and increasing pump capacity on short-duration, low-volume sewer overflows.

AMP8 Accelerated Schemes

Two further schemes are included within our Supply/Demand Balance (SDB) as part of our accelerated AMP8 programme - Draycote Reservoir expansion and the accelerated delivery of our AMP8 metering programme. Increased capacity at Draycote Reservoir will provide additional raw water storage and a deployable output (DO) benefit of 9Ml/d from 2026.

Our accelerated AMI smart metering programme includes an additional 250,000 smart meters to be installed by 2025 on top of those included in the original Green Recovery plans, providing a further 11.3MI/d modelled benefit to our SDB by 2026/27.

Using new technical supply and demand planning methods

We use a variety of complex methods to model the future supply and demand for water along with the choices and decisions that we must take to maintain future security of supply. Some of these best practice technical methodologies have evolved since WRMP19.

The most significant methodology updates that have informed this WRMP24 are:

- The use of stochastic datasets to model our system deployable output and resilience to extreme drought events.
- The use of UKCP18 climate datasets to inform future climate change scenarios.
- The understanding of ongoing COVID-19 effects on customers' water demand patterns.
- Investment modelling that incorporates best value criteria as well as standard cost data.
- The quantification of what future abstraction changes would be needed to achieve the EA's environmental destination scenarios.

The appendices that accompany our WRMP24 provide a comprehensive explanation of these methods and how they have been used to inform this plan, a further summary of updates between WRMP19 and WRMP24 is below.

- We have updated our catchment inflows using the latest GR6J models to give improved calibration against natural flows. We have also updated our baseline models with changes to our system following WRMP19. These include changes to abstraction licences, updates to our sites, sources and network e.g., groundwater deployable output (DO) and surface water site capacities.
- The key change to our DO modelling for this plan has been the use of stochastic data to model a much wider range of droughts including extreme droughts. This is because we are now required to be resilient to droughts with a return period of 1 in 500-years at emergency drought order (EDO) level, i.e., rota cuts/standpipes. Modelling/calculating the DO with a return period of this length required the use of a much longer time series. In WRMP19 and previous plans, we modelled our baseline DO using around 100 years of historic time series data, whereas for this plan our baseline DO is calculated using 19,200 years of data.
- In line with the supplementary guidance to the Water Resources Planning Guidance, to enable us to understand the return period of the deployable output of this long time series, we have also changed our modelling approach from using the English Welsh DO method in Aquator to using the Scottish DO method. The Scottish DO method is more suitable for the new guidance as it not only gives a DO, it also gives a return period for that DO. This has enabled us to understand the DO for multiple return periods, specifically the DO for 1 in 500- and 1 in 200-years. For more information on this please see Appendix A.
- All scenario modelling has been carried out using the new stochastic baseline as the starting point. Our WINEP and climate change scenarios, for example, have then been applied to the stochastic data.
- We have fully updated our supply side climate change assessment using the latest UKCP18 products. Our full climate change methodology is included in Appendix A3. Our core climate change modelling uses the Regional Climate Models (RCM) dataset from the UKCP18 data suite. We have modelled using RCP 6 (Representative Concentration Pathway 6) which assumes a 2°C warming. These updates to our climate change assessment have also fed through into our baseline supply demand balance from the start of the plan.
- We have also included all AMP7 schemes as currently planned. These have been updated to include the change of scheme in the Strategic Grid WRZ between PR19 and now; from the Bamford to Grindleford scheme; to the Thornton to Cropston scheme as reported in our WRMP Annual Review.

All the above updates have been done to ensure we follow the latest guidance and give the most accurate assessment of deployable output for our baseline WRMP tables.

AMP7 Supply Schemes included in our baseline (and scenario) modelling.

We have included the following AMP7 scheme updates in our deployable output baseline and scenario modelling:

- Church Wilne Green Recovery Scheme - We have included the scheme as planned in our modelling, including a new abstraction licence at Shardlow and new water treatment works at Witches Oak. The new works and abstraction licence will provide around 50MI/d average and up to 90MI/d peak benefit.
- Strelley Distribution Service Reservoir (DSR) to Redhill DSR internal transfer - Our baseline model includes the network updates that allows 25MI/d to transfer between the Strategic Grid WRZ and Nottingham WRZ.
- Thornton to Cropston - This has been brought forward to AMP7 and replaces the Bamford to Grindleford pipeline increase. We have included the scheme as planned with a direct link from Rothley Brook to Cropston WTW, with an updated licence and new pipeline. Our modelling shows the scheme gives a benefit of up to 10MI/d.
- Peckforton Scheme - Our baseline modelling includes this scheme, with enhancements to water treatment and protection of the groundwater DO, alongside AMP7 licence updates which have protected the annual licence of this source. This gives a zonal benefit of 36MI/d. Please note that this benefit was calculated using the historic inflows dataset. However, we expect a similar benefit using stochastic data.

As shown in our WRMP tables, these schemes come online during the following years:

- Witches Oak – 2025/26
- Strelley to Redhill – 2025/26
- Thornton to Cropston – 2025/26
- Peckforton – 2025/26

New, emerging water quality issues impacting both our Witches Oak and Thornton to Cropston schemes mean they may not be online as early as had been planned. Since our revised draft submission, we have sought to ensure we can maintain a supply demand surplus by increasing use of our existing licence on the River Derwent, allowing us to treat up to 40MI/d of River Derwent water at the new Witches Oak site. This is facilitated by aggregate licence conditions that include the Witches Oak abstraction licence and River Derwent spare licence capacity that will be used for our Little Eaton expansion scheme later in AMP8. We continue to work on solutions to mitigate any delays and have a treatment solution identified that will be in place by December 2027 if required. We have also adjusted our headroom risk profile as detailed in appendix C. These two measures manage the risk and maintain an adequate supply demand balance while we implement additional treatment measures to mitigate the water quality risk.

It is important to be clear with regulators, stakeholders and customers that the water quality issues we are experiencing at both Thornton to Cropston and Witches Oak are from a new risk that was unknown when we commenced this scheme. We recognised the (previously unknown) emerging PFAS water quality risk and therefore included an additional enhancement investment request within our PR24 business plan representation on the Draft Determination to Ofwat in 2024 to remove this risk. We have successfully secured funding for the PFAS mitigation scheme through the final determination from Ofwat. We are confident in our ability to ensure the PFAS investment is complete and the scheme being fully on-line by end December 2027.

We are confident in our ability to deliver the full benefit of our Witches Oak green recovery scheme by end December 2027. We understand our assets and network and will be able to mitigate against any security of supply risks by effectively managing our network and the output from other treatment works, such as Church Wilne, as an interim

action during the period 2025-2028. As stated above we have also made use of our existing licence on the River Derwent. We have mitigated against the risk of non-delivery in 2025 for our Thornton to Cropston scheme through an adjustment of our headroom risk profile in the period 2025-2028. It is also worth noting that the water resource zone remains in surplus if the scheme is not fully available in 2025.

We are not proposing alternative supply options that could be brought forward from our WRMP as an alternative for Witches Oak or Thornton to Cropston. This is because it would not be possible to construct any alternative supply option within the timeframe detailed. Since our revised draft WRMP, our PR24 Final Determination from Ofwat has been approved. As no alternative supply scheme could feasibly be delivered before December 2027, our business plan that we submitted for PR24 final determinations did not include a funding request for this.

Our Approach to Problem Characterisation

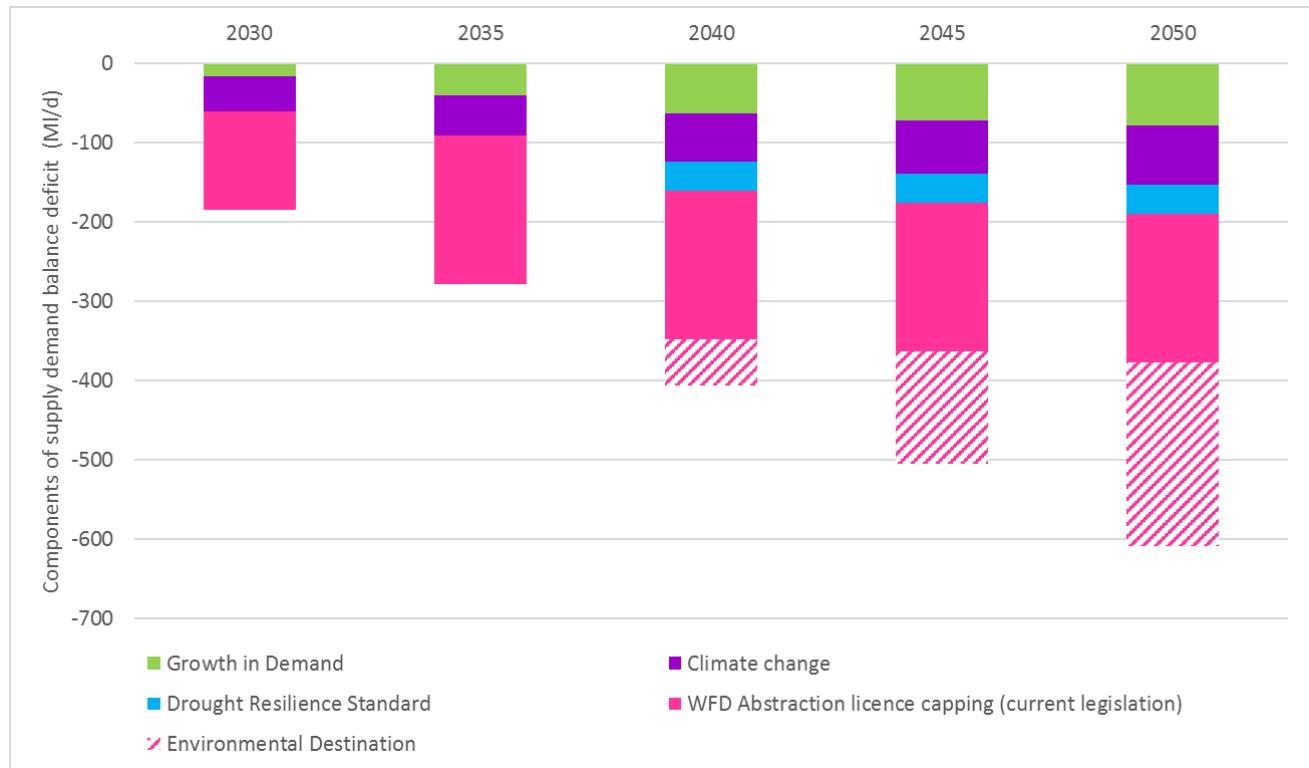
We used the United Kingdom Water Industry Research (UKWIR) problem characterisation approach to determine the size and complexity of the supply demand situation for Severn Trent. This is an established technique that all water companies used to inform the development of their 2019 WRMPs. For WRMP24 we updated our assessment to provide an initial view of the baseline. This used outputs from our WRMP19 and took account of expected changes in the supply demand balances up to 2025. The output of our problem characterisation review has shown that overall, the company level of risk and complexity had not changed between WRMP19 and WRMP24, scoring a high level of concern. As a result, our use of extended approaches/tools for planning including the Water Infrastructure Supply Demand Model (WiSDM) and the Decision Making Upgrade (DMU) model were used in producing our WRMP24. Further details on the problem characterisation can be found in Appendix F.



Drivers of our deficits

The primary drivers of the deficits that our plan is needing to address are growth in demand from our customers, climate change impacts and reductions in water available to abstract due to the WINEP licence capping requirements. From 2040 onwards, the increased drought resilience standard and delivery of long-term environmental destination add to the potential deficits were we to do nothing. These are illustrated in figure 3.7. Full details of our supply side assessment are included in appendix A.

Figure 3.7: Primary components of the baseline deficit



Outage allowances have been reduced by 40Ml/d, a 30% reduction in comparison to WRMP19, meaning there is a lower impact forecast, improving our supply demand balance, and as such is not a driver of investment. Details of our improved outage calculations are provided in appendix A.

Non-Public Water supply users switching to public supplies was assessed in collaboration with our WRW regional partners. Our assessments concluded that all non-public water supply sectors will need as much time as possible to plan for any reductions in water availability either through permanent abstraction licence changes or the impacts of climate change/drought. It is important to identify sustainable options that can allow these other sectors to grow in the future. It is largely unfeasible for non-public water supply abstractors to switch to a public water supply due to prohibitive costs; moreover, the demand put upon the public supply network would be large and sudden (e.g., the water taken to irrigate a field for a day would empty a service reservoir in a matter of hours). An assessment has been made of the demand for water from new customers switching to public water supplies in a significant drought. Practically we estimate that the number of new customers of this type are very low because a new connection often takes time to arrange and can involve significant cost to lay pipes. As part of our continued commitment to support the regional planning process we will work with regulators and the non-PWS sector to assess future needs.

LINKS TO OTHER PLANS

Our WRMP24 has been developed closely alongside a range of other plans (see table 3.1).

Table 3.1: Alignment with other strategic plans

Plan	How our WRMP Links
PR24 Business Plan	Our business plan is the mechanism through which we set out our investment needs for the next AMP. This investment will be used to deliver the outcomes specified in our WRMP. This WRMP has been developed in close conjunction with our PR24 planning process, including the use of long-term adaptive planning across all water and wastewater activities, planning for common reference scenarios, linking new plans to delivery of previous ones, and using robust and consistent cost estimates.
Drought Plan	Our drought plan sets out the short-term operational steps we will take if we face a drought in the next five years. It describes how we would enhance available supplies, manage customer demand and minimise environmental impacts as the drought progresses. Appendix A details how our WRMP and Drought Plan link.
River Basin Management Plan	Our WRMP contributes to the objectives set out in the Environment Agency's River Basin Management Plan (RBMP).
Drainage & Wastewater Management Plan (DWMP)	In June 2022 we published our first draft DWMP. We have worked closely to align assumptions, including growth forecasts and climate change scenarios used to develop our plans
Drinking Water Safety Plan	These plans provide a means of identifying hazards and hazardous events that could arise in our catchment areas, from the source up to the customer's tap. The activities proposed in our WRMP have taken these hazards into account and we have included mitigation measures where needed.
Local Authority plans	Our WRMP reflects local growth ambitions and we take account of the additional water needs of new businesses and households.
Water Resources West Regional Water Resources Plan	There is direct alignment between the Severn Trent plan and the Water Resources West Plan.
Government 25 Year Environment Plan	We have included the requirements set out in this plan and developed our environmental destination, long term demand management objectives and catchment approach to achieve this. We have used natural capital in decision making and delivery of net gain for the environment as one of our metrics.
UK water efficiency strategy to 2030	We will work with various sectors as a route to greater water efficiency, ensuring water for people, economy and the environment. We have helped influence this document.

4. OUR FUTURE CHALLENGES

We review our WRMP every five years and revise our long-term plans to reflect our latest understanding of the future supply and demand needs. In this plan we describe the challenges we face and how we expect to meet them. A summary of those key challenges is outlined in this section.

SUPPLYING FUTURE POPULATION GROWTH

We need a plan that can provide a reliable supply of water to our current and future customers. We expect population and housing numbers to continue to grow across our region; we need to be able to meet that growth in demand for water services against this uncertain outlook. Our plan is to offset this growth through demand management measures, by improving the flexibility of our water supply network, and by providing new sources of water where necessary.

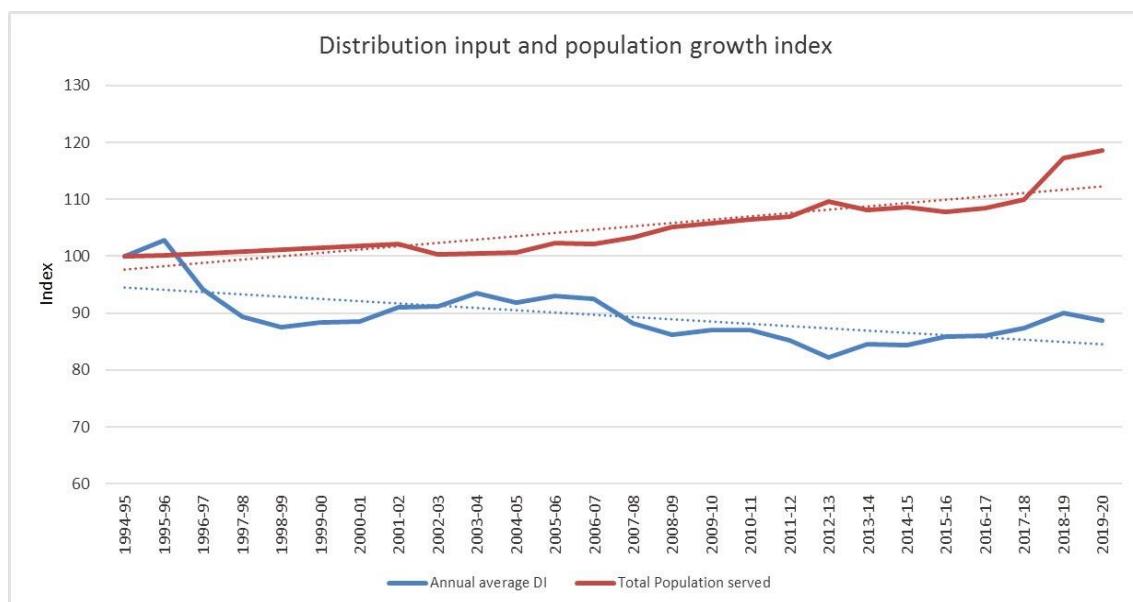
Since 2000 the population of our region has grown by 1.2 million people, but over this same period the total amount of water we put into supply has broadly remained flat. We have achieved this in part by reducing leakage on our own network and helping customers to reduce their own water consumption.

Figure 4.1 illustrates that the long-term downward trend of water into supply has been achieved against a backdrop of steadily growing regional population. Within this timeframe and long-term downward trend, there have been short periods of rising and falling water into supply linked to the economic cycle affecting commercial demand, weather trends impacting leakage in the winter, and household consumption in the summer. For example, since 2012/13 we have seen an increase in commercial demand linked to the wider economic recovery and the hot and dry summer of 2018 saw an increase in household demand.

This long-term pattern reflects the success of our ongoing leakage reduction, water efficiency and metering activities. We achieved a leakage reduction of 62MI/d (12.5%) between 2010 and 2020, and reduced water consumption by around 45MI/d through our water efficiency programme.

This WRMP24 highlights that the population of our area is likely to grow by a further 1.1 million people over the next 25 years and by 2.6 million people over the next 60 years, and at the same time our water resources will become scarcer. Therefore, we need to increase our leakage and demand management efforts even further to help offset this growth in water demand where possible.

Figure 4.1: Index of Distribution Input and population growth from 1994 to 2019/20 (our base year)



Appendix B of this WRMP24 provides a detailed breakdown of the future population, housing and water consumption trends that we expect to have to meet.

MEETING THE CHANGING DEMAND FOR WATER

As well as taking future population growth into account, our plan also considers changing water consumption patterns.

Our experience over recent years is that changing peak demand patterns are posing an increasing challenge to the resilience of our water supplies. Peak demand is most often driven by hot weather when customers use significantly more water than usual. While average per-capita consumption (PCC), the amount of water each customer uses each day, has remained stable over the last decade, peak consumption has risen over the same period. Recent experience has shown us that in the Severn Trent region, overall demand for water increases by up to 24% in temperatures above 26°C. Climate change scenarios tell us that the frequency, intensity and duration of hot weather periods is likely to increase and put significantly more stress on our water supply systems.

During the COVID-19 pandemic we observed a large increase in household demand, and when consulting with customers and stakeholders on our draft plan we were still experiencing the impacts of customer behaviour change on household consumption. Although household consumption has returned to pre-covid levels, it remains higher than we had forecast it would be at this time in our previous plan (WRMP19). Although we are not including an ongoing uplift factor in our demand forecast, the increases observed do mean we have more to do to achieve the long term 110 litres per person per day target.

The use of innovative tariffs was considered as part of our long-term ambition to meet future demand and support customers in reducing their water use. For this plan we are not including variable tariff options however in our business plan we have included proposals to trial rising block tariffs with 3000 of our smart metered customers starting in 2025/26. This was approved in our Business Plan Final Determination and will allow us to understand the benefits of alternative tariff options when linked to smart meter data and consider development of options for WRMP29. Before wider roll out of variable tariffs further consultation is required with both Ofwat and our customers.

Water labelling is a national, government led water saving program, designed to introduce efficient purchasing behaviours and water using products into home. It will play a key role in achieving the long-term PCC reduction ambition and influencing customers behaviour nationally. We are committed to supporting this programme and will communicate and educate customers once the programme is announced by Government, manufacturers and retailers.

IMPROVING OUR RESILIENCE AGAINST DROUGHT

The primary objective of the WRMP is to demonstrate that we will be able to sustainably meet the demand for water over the next 25 years and beyond, even when under drought conditions. The 2021 Water Resources Planning Guideline recommends that as a reference level of service, companies' WRMPs should be resilient to a 0.2% annual chance of failure due to drought, giving a 1 in 500-year level of resilience by 2039. This level of service is set against the introduction of emergency drought orders such as the use of standpipes.

Our WRMP24 ensures that we will meet this 1 in 500-year level of resilience by 2039, however our assessment concludes that through the actions we have taken in the past, our raw water supplies are already at a 1 in 200-year level of resilience.

Customer Research for this WRMP (described in detail in section 7 and appendix H) shows that the majority of customers find the proposed 1 in 500-year level of resilience by 2039 acceptable and recognise that drought measures would be a last resort in exceptional circumstances. The supply/demand solutions included in our WRMP24 will mean that we no longer need to rely on the use of drought permits or drought orders in the event of extreme drought. The failure point we use to define emergency drought orders is modelled in our company water resources model (Aquator) and is the point at which one or more of our strategic raw water storages reservoirs hit dead storage and/or the point at which one or more of our demand centres has a large deficit. For more details, please see Appendix A. This WRMP24 safeguards through to 2050 our committed level of service to our customers of not requiring Temporary Use Bans (TUBS) or Non-essential Use Bans (NEUBS) more than 1 in every 33-years.

SECURING SUSTAINABLE ABSTRACTION AND PREVENTING FUTURE ENVIRONMENTAL DETERIORATION

In its 25-year Environment Plan the Government has set out ambitious long-term goals to protect and enhance the water environment by improving at least three quarters of our waters to be close to their natural state as soon as is practicable. These long-term goals are reflected in the EA's latest River Basin Management Plans.

To achieve these goals, we will need to make large scale changes to the ways we abstract water from our sources of groundwater supply. By the 2030s the EA's abstraction licensing policy means that many of our existing groundwater abstraction licences will be capped and we can no longer assume that any spare licence capacity will be available to meet future needs.

In the longer term, by 2050, the current guidance on WFD no deterioration licensing capping and environmental destination means we would need to reduce groundwater abstraction to help achieve the environmental destination goals described in the EA's National Framework.

The long-term sustainability of water supplies is core to our WRMP, as represented by the sustainability reductions we have committed to for WFD licence capping in the near term and our long-term approach for Environmental Destination. Long term, sustained demand reduction is key to balancing supply and demand and minimising the amount of water abstracted from the environment. Since the draft WRMP24 was published we have continued our technical assessment of the WFD environmental risks associated with our sources of abstraction and we have worked with the Environment Agency to better understand their expectations. In particular, we have refined our assessment of how any future abstraction licence changes should be represented in the PR24 WINEP and the WRMP.

We have undertaken extensive discussion with the EA to agree appropriate timing for licence capping, which has been agreed and incorporated within our final plan. The drivers for these abstraction licence changes fall into two broad categories:

No deterioration of WFD status

We first identified the need for proactive actions to prevent WFD status deterioration in our WRMP19 and we described our best estimate of what those long-term impacts could be. For example, in WRMP19 we committed to reducing our groundwater abstractions in the Nottinghamshire WRZ by 23.5Ml/d and we also committed to prevent future deterioration by giving up spare abstraction licence capacity of up to 88Ml/d at our other groundwater sources abstracting from the Sherwood sandstone aquifer. We also committed to ambitious demand management and leakage reductions to help prevent future growth in water abstraction. These WRMP19 commitments alone will improve the long-term resilience of the Sherwood Sandstone aquifer.

Since WRMP19 the EA has issued new guidance on preventing deterioration and has updated its abstraction licensing approach to reflect this. We have also updated our thinking and datasets in response to the consultation feedback we received on our draft WRMP24. As a result, in our updated WRMP24 we have included our latest assessment of what these impacts will mean for those sources of supply where our current abstraction licences will need to be capped.

Overall, we estimate that the impacts of these changes will mean that the licence capping policy will reduce our current deployable output by 187Ml/d by 2035 while the medium to longer term environmental destination impacts will reduce our deployable output by a further 231Ml/d by 2050. For our preferred WRMP we have listened to the feedback from our stakeholders, and we will accelerate the delivery of our long-term environmental destination commitments. We have explored a range of potential environmental destination scenarios and the profile used in our preferred final plan reflects the affordability and deliverability of the AMP-by-AMP new water resource schemes that will be needed to

accelerate the future abstraction reductions. The details of the year-by-year abstraction reduction profile are in the final WRMP data tables. We have also updated our Environmental Stretch adaptive pathway to account for different delivery profiles. These are material changes to our supply capability and our plan includes the supply and demand investment that will be needed to accommodate these changes without destabilising public water supplies.

To put this into a Water Resources West (WRW) regional context, for the BAU+ scenario we are contributing 70% of the planned deployable output reductions across the whole of the WRW region to deliver environmental improvement and prevent future deterioration by 2050.

Long-term environmental destination

Many of the surface water bodies in our region are at risk of failing to achieve their ecological flow targets due to the fact that the underlying groundwater bodies are over-abSTRACTED or over-licenced, meaning that surface water is no longer supported by groundwater levels. Our previous WRMPs have tackled these problems through the AMP by AMP restoring sustainable abstraction/WINEP programme and we have been steadily improving this situation on a site by site basis.

For this round of WRMPs the EA's National Framework sets expectations that the new regional water resources groups will make a step change in how water resources management plans should proactively include the future needs of the environment. For the first time, water companies are being asked to assess what long term abstraction reductions might be needed to help achieve ecological flow targets in the face of future climate change and demand growth. This new approach to thinking about the long-term environmental destination is one of the most significant challenges for our WRMP24.

Table 4.1 shows the reductions in our current deployable output that would be needed to achieve the different scenarios that the EA has asked to be considered. We have used the EA's scenario datasets to examine the full range of how these potential environmental destination scenarios could impact on our plan. We have used these investment scenarios to inform our no/low regret investment decisions as well as the uncertainty around the future alternative pathways that are included in our WRMP24.

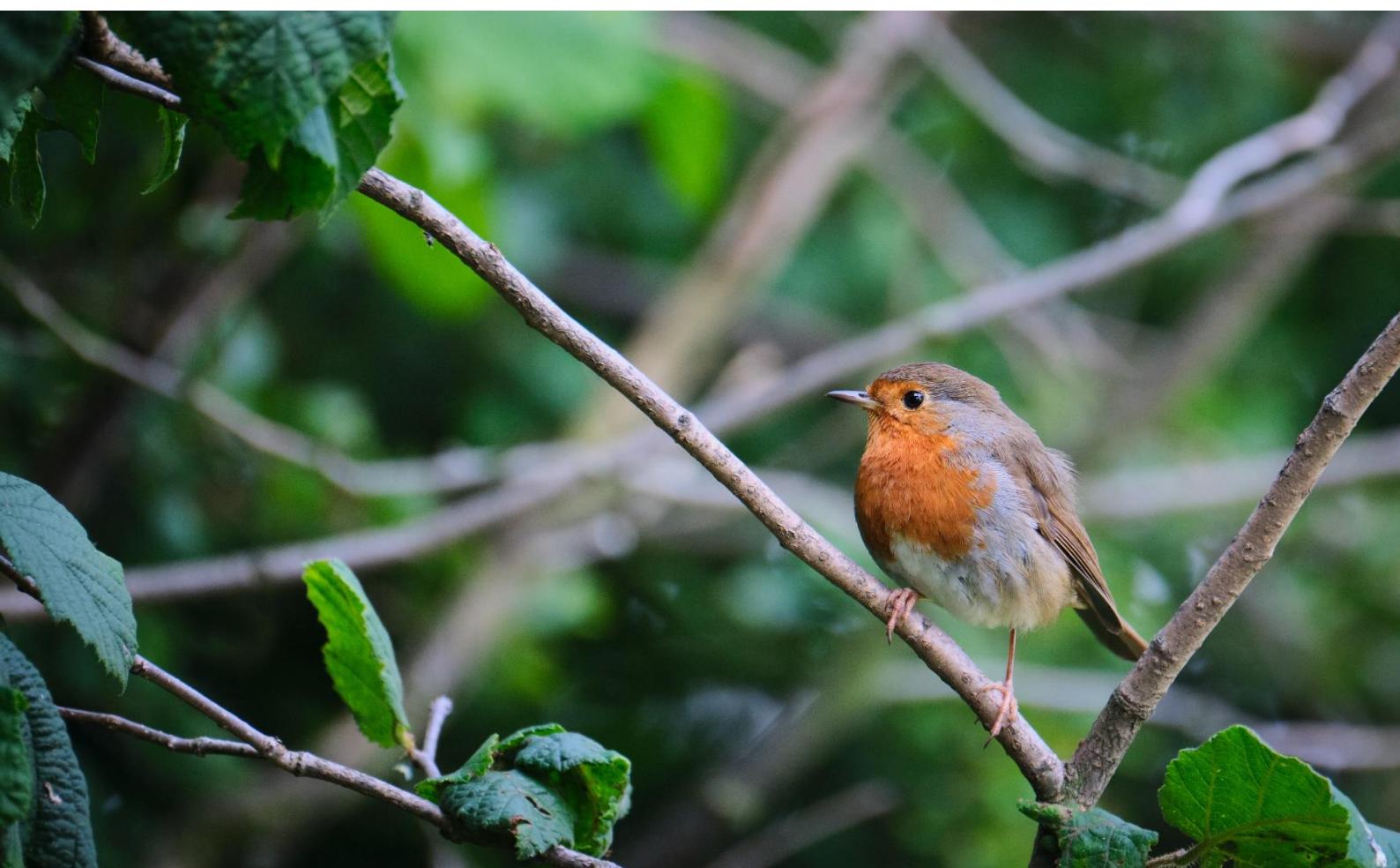


Table 4.1: Total Environmental Destination sustainability reductions by 2050

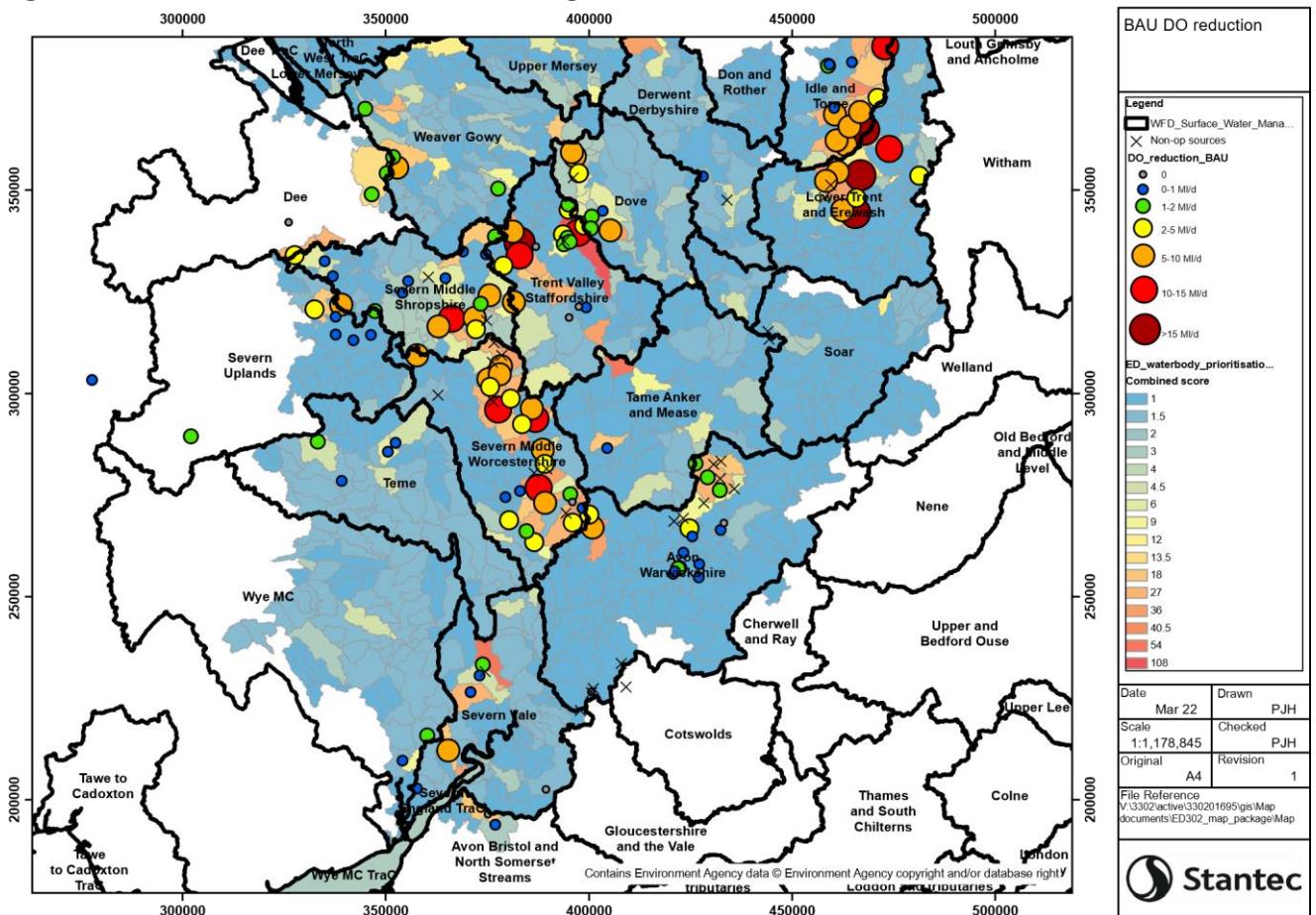
Enhanced	BAU+		Plausible Low
	Min to be included in the WRMP baseline tables	BAU	
Ofwat high	+	BAU	Ofwat low
Reserving additional flow for the environment where there are Sites of Special Scientific Interest (SSSIs) or protected species	European protected sites needs	Protecting the same proportion of the current ideal flow into the future	Removing abstraction reductions where there is higher uncertainty on the benefit
-449MI/d	-418MI/d		-309MI/d

These National Framework environmental destination scenarios have a material impact on our long-term supply/demand balance. For WRMP24 we have incorporated existing legal requirements into our supply forecasts in the short to medium term (2025-2040) and used the BAU+ scenario in our longer-term baseline planning assumptions to inform the preferred plan. We have used the high (enhanced) and low scenarios to develop our adaptive pathways. Alongside our WRMP24, our PR24 business plan also includes significant investment in more detailed environmental investigations during 2025-2030 to better understand these long-term ecological targets and to reduce the uncertainty around the scale of future investment needed.

Figure 4.2 illustrates the locations of our abstractions that are likely to be affected by these long-term abstraction reductions. It illustrates how the abstractions being targeted for future reductions are clustered in our groundwater dominated supply systems which means that significant new, alternative sources of supply will be needed in these areas.



Figure 4.2: Groundwater abstraction reductions targeted for environmental destination BAU+ scenarios



We reported our initial estimates of what the National Framework environmental destination scenarios could mean in the WRW Emerging Regional Plan that was published in December 2021. At that time, we excluded these environmental destination scenarios from our preferred plan, and we instead presented them as an alternative possible future pathway due to the uncertainty and the potential magnitude of impact on the supply/demand balance. The EA's feedback on that emerging plan made clear that we are expected to include the environmental destination scenarios within our baseline planning assumptions and so we have used the National Framework scenario data to inform our WRMP24 preferred plan.

For more information about our Environmental Destination work, please see Appendix D.

As part of our sustainability journey, reducing greenhouse gas emissions from our activity is key. Our WRMP plays an important role in this ambition, and we outline our net zero transition plan in our Annual Report and Accounts (ARA), supported by further detail in our Sustainability Report. These can be found on our website at severntrent.com. They detail our greenhouse gas commitments, our glidepath, our reduction programme, current performance with supporting evidence on our key areas of progress and challenge areas. Our Taskforce on Climate Change Related Financial Disclosure (TCFD) in our ARA also outlines how we understand and manage climate change risks and opportunities across the Group.

PLANNING FOR CLIMATE CHANGE AND UNCERTAINTY

Our WRMP24 takes into account the potential long-term impacts of climate change on our water resources as well as addressing the significant uncertainty around those long-term impacts.

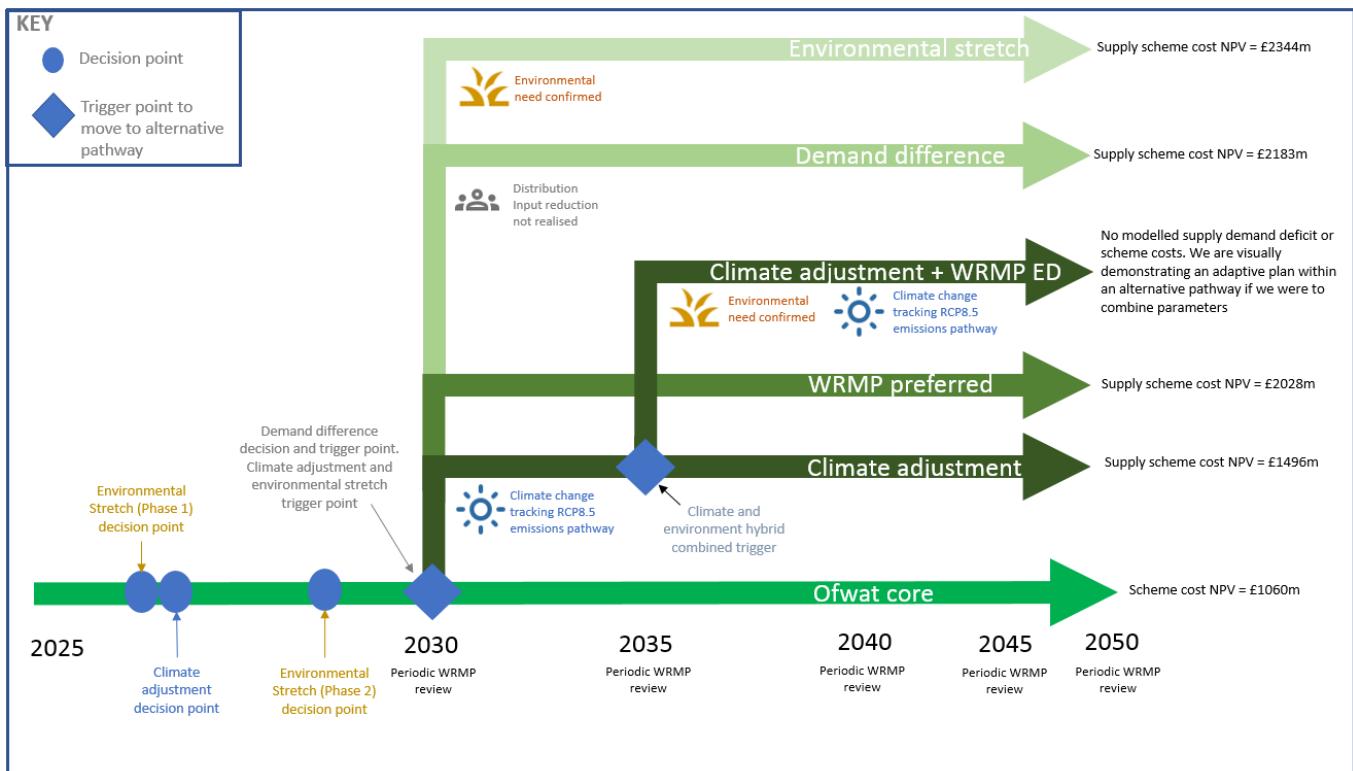
Our WRMP24 uses the best practice UKCP18 datasets and combines them with our own water resource modelling capability to produce a range of plausible, climate impacted future scenarios. We have aligned our approach to modelling climate change with the other companies in our region, using Regional Climate Model (RCM) data for our baseline plan central estimate and probabilistic data for our uncertainty modelling.

Our plan is based on RCP6.0 (Representative Concentration Pathway 6) which represents a 2°C warming scenario. We have also tested our plan to a range of other climate scenarios to explore the impacts of more or less extreme climate outcomes.

While the UKCP18 climate change scenarios present us with a wide range of potential impacts, almost all the scenarios point to a long-term loss of water resources and deployable output due to changing weather conditions. As a result, the potential uncertainty around climate change impacts does not detract from the ambitious no/low-regret leakage, demand management and supply investment that we need to have in place ready to accommodate the abstraction licence capping that will be needed by the 2030s to prevent WFD status deterioration.

Our approach to climate change modelling for supply is described in detail in Appendix A3. Our approach and the products/ tools used to look at the effects of climate change on demand are described Appendix B of the WRMP particularly in sections B2.4.7 (Household), B3.6.3 (Non-household) and B3.6.4 (Uncertainty). Fig 4.3 illustrates our alternative pathways, more details are provided in appendix G.

Figure 4.3: Our Alternative pathways



MANAGING UNCERTAINTY AND MAKING COMPLEX DECISIONS

This WRMP24 describes how we will maintain the long-term supply and demand for water in an uncertain future. We have used evidence and models to generate our best estimates of how population and housing growth, climate change and environmental impacts could affect the future security of public water supplies. However, while we can make informed projections of how these different drivers are likely to change over time, the further ahead we look the less certainty we can have.

At the same time, we are able to make informed assumptions around the different interventions we can make to influence future water demand or improve water supply. However, there are uncertainties around the benefits and deliverability of the supply and demand schemes we may deliver. For example, environmental constraints mean that future water supply solutions may become increasingly complex to construct and deliver.

Our WRMP24 explicitly considers these different elements of planning uncertainty using an adaptive planning approach. Our decision-making approach and investment modelling has explored a wide range of potential future supply/demand scenarios and we have tested the robustness of our decisions based on the confidence we have in our investment options. Many of the factors that will influence future water supply and demand are highly uncertain and outside of our direct control. The advantage of an adaptive planning approach is that it allows us to test how robust our investment decisions might be in different scenarios, and it allows us to better understand when critical investment decisions might need to be taken.

To inform our decision making we have identified which key planning assumptions would have a material impact on our plans if they were to deviate from the best central estimate. We have then quantified alternative projections of the future supply and demand for water that could arise under these alternative scenarios. For example, our preferred plan uses climate change assumptions based on the median RCP6.0 projections of global greenhouse gas emissions, but we have also explored what investment would be required if the effects become more severe or if future emissions follow the RCP8.5 higher emissions pathway. We have also tested the sensitivity of our investment decisions against Ofwat's common reference supply/demand scenarios.



As a result, our WRMP24 describes the low-regret decisions that we need to take in the near term to ensure we can adapt to known supply and demand changes between now and the 2030s, such as the EA's abstraction licence capping policy. Our plan also describes the different decisions that we may need to take in the very long term to 2050 and beyond, such as the environmental destination scenarios and what may be needed to protect the water environment from the impacts of climate change. Our preferred plan is based on our best estimates of what the future might look like, and we also present alternative future pathways that demonstrate how we would adapt to changing circumstances if they unfold over time. Whilst we have explored multiple possible supply/demand future scenarios, we have reported five alternative future pathways in this WRMP24. These are summarised in Table 4.2.

By testing multiple alternative supply/demand futures through our investment optimisation modelling, we have a good understanding of what our alternative plans would look like under different scenarios, and what our preferred alternative options might be. Our approach gives us the flexibility to change our plans over time as the uncertain becomes more certain. We recognise that if an intervention is planned to address a shortfall in the future, there could be benefits of delaying a project where there was a significant degree of uncertainty. The use of an adaptive planning framework is a solution that offers customers the greatest protection from over-investment too early and bearing unnecessary risk.

Table 4.2: Our WRMP24 alternative pathways

Alternative pathway	Description
Core Pathway	<p>Follows Ofwat's PR24 definition and includes all activities that need to be undertaken to be ready for all plausible future scenarios includes:</p> <ul style="list-style-type: none"> • investment required to keep future options open (such as enabling work or learning and monitoring) · • No and low regrets investment decisions to meet the supply-demand deficit with best-value solutions: <ul style="list-style-type: none"> ○ in both benign and adverse scenarios; ○ across a wide range of plausible scenarios; or ○ need to be undertaken to meet short-term requirements
Climate adjustment	Our climate adjustment pathway details the solutions required for a supply-demand deficit under RCP8.5, aligning with Ofwat's high common reference scenario on climate change.
Environmental stretch	This pathway uses the impacts of the EA's enhanced abstraction reductions due to Environmental Destination with all reductions in 2050 as per Ofwat's adverse common reference scenario on abstraction reductions
Demand difference	This pathway uses a lower distribution input reduction than our core scenario. If the demand benefits are less than assumed and/or population growth is higher, we will need to follow this pathway.

Please see Appendix C (Managing Uncertainty) for more information regarding the process we have followed to assess uncertainty around our supply and demand components. More details of our adaptive planning approach can be found in Appendix F.

THE SIZE OF OUR SUPPLY/DEMAND CHALLENGE

Each of the different pressures outlined previously mean that overall, we are facing a significant challenge to our future water supply/demand balance. Using our best estimates of how these different baseline planning assumptions might evolve over time, we are projecting supply deficits in many of our WRZs by the 2030s, and in all WRZs by the 2080s. We have explained previously that abstraction licence capping and the longer-term environmental destination pressures have most impact on our groundwater sources. The effects of these pressures are shown in table 4.3 which illustrates how many of our groundwater fed WRZs go into deficit in the 2030s due to the impacts of abstraction licence capping to prevent WFD deterioration. The supply/demand balance shown includes the benefits of drought measures in line with our levels of service. In the longer term these deficits increase as a result of the need to reduce abstraction in line with current guidance to achieve the environmental destination goals. By the end of the planning period, all WRZs will be in supply deficit unless we invest in supply and demand interventions to prevent this happening.

Table 4.3: Baseline supply/demand projections

WRZ	2024-25	2029-30	2034-35	2039-40	2044-45	2049-50	2054-55	2059-60	2064-65	2069-70	2074-75	2079-80	2084-85
Bishops Castle	1.22	1.2	1.21	-0.21	-0.23	-1.01	-1.04	-1.07	-1.10	-1.12	-1.16	-1.19	-1.22
Chester	0.92	0.86	1.00	0.72	0.59	0.30	-0.12	-0.54	-0.93	-1.48	-2.0	-2.49	-2.66
Forest and Stroud	4.28	4.10	4.37	4.07	-1.39	-1.46	-1.70	-2.12	-2.59	-3.00	-3.51	-4.12	-4.46
Kinsall	0.60	0.54	0.31	-0.03	-0.04	-0.07	-0.11	-0.17	-0.23	-0.29	-0.34	-0.42	-0.47
Mardy	0.14	1.35	0.61	0.56	0.54	-2.05	-2.09	-2.12	-2.16	-2.21	-2.25	-2.29	-2.30
Newark	2.40	2.25	2.17	2.03	1.93	0.40	0.28	0.11	-0.05	-0.23	-0.32	-0.36	0.02
North Staffs	-29.15	-29.12	-58.16	-65.48	-65.40	-141.51	-142.95	-143.97	-145.75	-147.09	-148.46	-149.31	-149.34
Rutland	3.06	2.26	1.93	1.84	1.79	1.74	1.60	1.46	1.29	1.10	0.94	0.72	0.59
Ruyton	0.22	0.11	0.11	-0.73	-0.86	-1.38	-1.44	-1.49	-1.55	-1.61	-1.67	-1.74	-1.77
Shelton	14.37	11.55	-19.93	-25.49	-26.55	-70.77	-72.39	-74.28	-75.98	-77.79	-80.03	-82.39	-84.14
Staffs	5.27	4.62	3.84	0.61	0.40	-13.17	-13.44	-13.76	-14.03	-14.38	-14.80	-15.07	-14.82
Nottinghamshire	-24.66	-2.06	-28.96	-41.14	-61.79	-102.25	-104.72	-107.68	-110.82	-113.89	-117.35	-120.97	-123.18
Strategic Grid	-129.59	-108.41	-150.41	-174.93	-207.63	-255.35	-279.41	-302.52	-331.52	-355.58	-385.05	-410.01	-435.53
Whitchurch and Wem	3.99	3.77	0.01	-0.05	-0.08	-0.30	-0.39	-0.51	-0.66	-0.78	-0.91	-1.06	-1.15
Wolverhampton	6.18	5.55	4.59	1.60	-14.33	-14.61	-15.31	-15.96	-16.69	-17.55	-18.31	-19.37	-20.03

Chapter 5 describes how we plan to meet these future challenges through a combination of leakage reduction, household metering, water efficiency and new, sustainable sources of water supply. The actions we need to take to meet the 2030s supply/demand challenge form our no/low regrets investment plan and these are reflected in the ‘Ofwat core’ pathway that also features in our PR24 business plan.

In the longer term, the scale and pace of the growing deficits becomes more uncertain and whilst we have included recommended measures here in our preferred plan, we will manage these through our adaptive pathways planning.



5. OUR LONG TERM WATER RESOURCES STRATEGY

OUR PREFERRED PLAN

Our preferred plan is based around our commitments to halve leakage by 2045 and to roll out a universal household metering programme by 2035, accompanied by enhanced water efficiency activities that will help customers reduce their consumption. These same leakage, metering and demand management commitments underpin all the other alternative pathway investment scenarios we have included in the WRMP24.

The preferred plan also includes the no/low regret new water supply options that we think will be necessary over the next five to ten years to accommodate the vast majority of future potential long-term supply/demand scenarios. We are confident that we need to progress with these schemes through 2025-2030 ready to meet the challenges posed by abstraction licence capping in the 2030s and these same no/low regret solutions can be found in our 'Ofwat core' pathway.

Our preferred plan also indicates some large and challenging supply options that are likely to be required by the 2050s to meet the challenges presented by the EA's environmental destination scenarios as well as the impacts of climate change. The EA's Water Resources Planning Guidelines require us to include the BAU environmental destination scenario in our planning assumptions and so we have presented these long-term schemes in our preferred plan because they would be needed to maintain security of supply under this scenario.

PREFERRED DEMAND OPTIONS

Our preferred plan aspires to achieve challenging government targets across household consumption, commercial consumption and leakage. Our strategy aims to deliver a 110 litres per person per day consumption by 2050 via Severn Trent led water efficiency activity, household meters and the Government's Water Labelling programme due to launch 2025. We also target a 15% reduction in existing commercial consumption by 2050 compared to 2019/20 levels. Leakage targets are currently set at a 50% reduction by 2050 for the industry, however our plan is to achieve this level of reduction by 2045. The following sections give further details of our demand options.

As we work towards achieving these ambitious targets, the need of our vulnerable customers will be kept at the forefront of our plans and appropriate support provided to ensure their needs are met.

A summary of the demand options expected benefit is found in table 5.1.

Table 5.1: A summary of the demand measures we plan to implement and their expected benefits

Demand Activity	Benefit (per day)	By when
Roll out universal metering	52 million litres	2035
Reduce leakage by 50%	121million litres	2045
Deliver the Severn Trent Water Efficiency Plan	73 million litres	2050
Government Water Labelling	108 million litres	2050

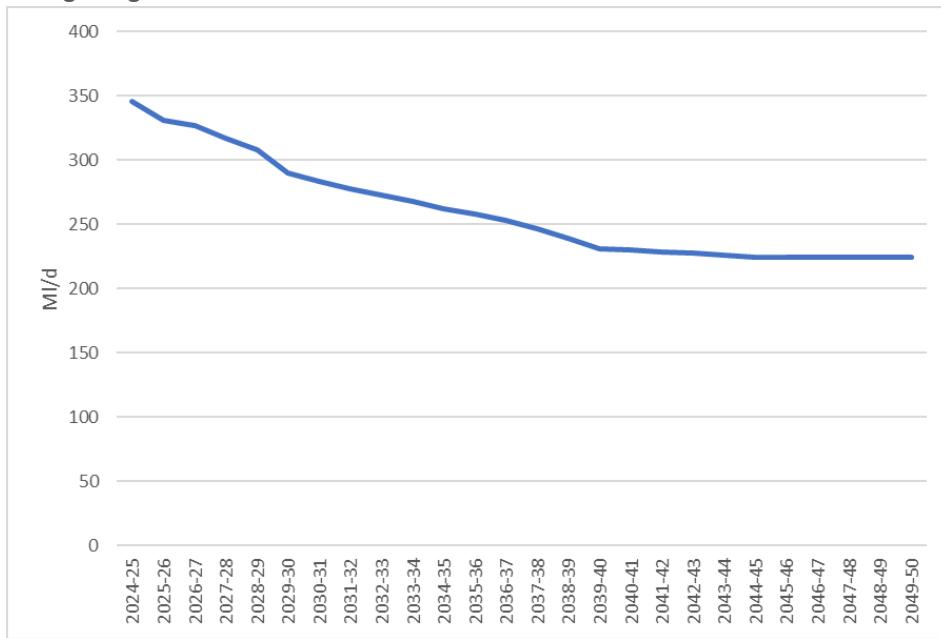


LEAKAGE REDUCTION

In WRMP19 we set out our long-term commitment to halve water leakage by 2045, and that commitment continues in this latest WRMP24. We have reviewed the planned leakage reduction profile and have amended it to reflect the likely future supply and demand pressures faced in different WRZs.

Our planned leakage reduction profile to meet our 2045 commitment is shown in Figure 5.1.

Figure 5.1: Future leakage targets



Our leakage reduction ambition is extremely stretching and will require more investment in a range of interventions to help drive down leakage from our network and from customers' pipes. Those activities include:

- **Active leakage control:** this is the activity to find and fix leaks as they occur on our distribution network. This becomes progressively more expensive as leakage reduces and smaller leaks become more difficult to find.
- **Mains renewal:** we need to increase the rate at which we renew mains in order that we can offset the effects of an ageing network and proactively prevent future leaks from occurring. Active leakage control alone will not be sufficient to reduce total leakage by 50% and an increase in mains renewal rates is needed to prevent the overall deterioration of our network over time and reduce the likelihood of future mains bursts and leakage occurring.
- **Pressure management:** reducing pressure in our supply system helps reduce leakage outbreak although it does not improve the condition of the network assets.
- **Reducing trunk mains leakage:** we will increase the number of meters on our trunk mains and improve our ability to find and fix trunk mains leaks.
- **Household water metering:** we plan to achieve near universal household meter coverage by 2035 using smart meter technology. This will deliver additional leakage benefits by helping us to identify leaks on customers' supply pipes and proactively repair them. As we drive down leakage on our water distribution network, an increasing proportion of total leakage will come from customers' supply pipes unless we intervene.

The combined benefits from increased investment in these activities will be required if we are to achieve our 50% leakage reduction target. The costs of these activities will be included in our PR24 business plan.

WATER METERING

In WRMP19 we described our strategy to achieve near universal water metering coverage across our household customer base by 2035. At that time our preferred approach was to proactively install water meters and encourage our customers to switch to measured charging over time. Since WRMP19 the EA has updated its water scarcity status assessment and has officially designated Severn Trent as being in a seriously water stressed area.

Our 2020-2025 metering strategy is based on three components:

- Free option (customer requested meters),
- Proactive meter install followed by customer persuaded option.
- A maintenance strategy to replace old or broken meters reactively.

Our free option component alone would only achieve 71% metered charging by 2035 and so we have assessed the best options to accelerate metered charging uptake.

Most water companies have started or plan to start a smart metering strategy and we have used their experiences to help inform our choices. Furthermore, as part of Ofwat's Green Recovery investment plan, we were awarded funding to trial a Smart Meter Network to understand the benefits of a Smart Network in our region and have also received accelerated funding from the 2025-2030 period to install an additional 250,000 meters by 2025.

To inform our preferred metering approach we have assessed the costs and benefits of a number of scenarios which considered differing combinations of the options below:

- Stay with our free meter and persuaded optant strategy.
- Switch to a compulsory metering policy.
- Stay with current Automated Meter Reading (AMR) semi-smart meter technology.
- Adopt Advanced Metering Infrastructure (AMI) full smart meter technology.
- Maintain our fix/replace on fail maintenance strategy.
- Switch to a proactive maintenance strategy.

As a result of the change in water scarcity status and having considered the different options, we are recommending a move to compulsory metering using AMI technology. Customer research tells us that our customers are supportive of this approach. Based on an assessment of supply pipe repairs, leak run times and industry studies we estimate the benefits as:

- **Consumption:** a 15% reduction = 21.3 litres per day/0.021m³ for every new AMI Meter installed.
- **Leakage:** 0.024m³/day customer side leak reduction.
- **Total benefit:** 0.045m³/day per meter installed.

We continue with our Green Recovery smart metering technology trial to improve our understanding of the costs and benefits of the different meter technology and roll out options.

Overall, we expect to install 1.1 million new smart meters and proactively upgrade over 600k existing meters by 2035. As part of our overall smart metering strategy, we will start upgrading the remaining non-smart meters to AMI in 2025.

WATER EFFICIENCY

Our universal water metering programme is complemented by our proactive water efficiency activities which will help customers reduce their water consumption and save money on their bills. We are committed to doing our part to help achieve the government's consumption target of 110 litres per head per day by 2050.

Our water efficiency activities include:

- Provision of free and subsidised products to household customers. We intend to increase promotion of these to drive an increase in uptake.
- Continuing and extending our home water efficiency audits (HWEC) to housing association tenants and our highest water using customers, where we will:
 - Give advice on reducing the volume of water they use.
 - Install water efficient devices where appropriate.
 - Repair leaks on internal fittings where it is simple to do so.
- Our universal metering programme and making increasing use of smart meter technology, we will proactively use leak alarms to identify opportunities to repair supply pipe leaks. We will communicate to customers what will be happening and how they can help reduce demand or get further support.
- Continuing to provide advice to our customers on how to reduce their water use, which includes continuing our work with schools, site visits and online interactive sessions.
- We also provide lots of advice and subsidised products via our website at stwater.co.uk/save.

Overall, we expect our proactive metering and water efficiency activities to reduce average per capita consumption to around 118 litres per head per day by 2050. We know that the government also intends to introduce legislation that will require mandatory water efficiency labelling of water using products including white goods, kitchen and bathroom fittings and updated water fittings and buildings regulations. Once this legislation is enacted we expect this to help drive per capita consumption down even further. These product and legislative changes will be required if together we are to achieve the government's overall target of 110 litres per head per day by 2050.

As well as working with household customers we will also extend our proactive water efficiency activities to work directly with non-household customers and collaboratively with water retailers to help them reduce water non-household consumption by 15% by 2050. We will use the learning from our Green Recovery delivery and other trials of working with schools and local authorities to extend these services in future. We will also continue to explore opportunities to help non-household customers with rainwater harvesting and grey water re-use options. In preparation for delivery of this non-household programme we have started a series of workshops with retailers to see how we can work better together to reduce demand and promote water efficiency with our 193,000 non-household properties.

Our preferred plan includes the demand saving benefits that will accrue from our proactive metering and enhanced water efficiency activities. We have also included the demand saving benefits that we expect to arise as the government implements the measures described in its July 2021 Written Ministerial Statement on reducing demand. The government has set out its intentions to:

- make regulations to introduce a mandatory water efficiency label to inform consumers and encourage the purchase of more water efficient products for both domestic and business use.
- develop a roadmap towards greater water efficiency in new developments and retrofits, including the exploration of revised building regulations and how the development of new technologies can contribute to meeting these standards. The government will ensure that the underlying legislation can, where appropriate, accommodate any potential future expansion of rainwater harvesting, water re-use and storage options.

These government led initiatives, if delivered in full and backed by collaborative multi-sector engagement and promotion, have the potential to make a material reduction in our future water demand projections and in our preferred plan we have included these benefits from the start of the planning period (2025). Recognising feedback and concerns raised through the consultation process over the reliance on demand management measures, we have an alternative pathway which describes what we could do if demand reductions are not met.

WATER LABELLING

Water Labelling is a Government led water saving program, designed to introduce efficient water using products (fittings and white goods) into homes, when replacing current products. It will play a key role in achieving the long-term PCC reduction ambition and influencing customer behaviour nationally. The successful delivery of the Government's long-term targets for customer demand reduction will require the support and participation of all stakeholders - Government, product manufacturers/retailers, water retailers, water wholesalers and of course customers. We will support as appropriate and promote via messaging to our customers to bring to their attention the roll out of the programme and encourage customers to adopt efficient devices and practices.

We are committed to communicate and educate our customers on the Water Labelling Programme and will take appropriate steps once the programme is announced by the Government, manufacturers and retailers. Our WRMP is dependent on water labelling benefits to achieve the ambitious PCC reduction targets and assumes benefits of 'Water Labelling' reducing household consumption from 2025, the date from which it is expected the Government will start implementing a Water Labelling programme in England with appropriate levels of funding.



OUR PREFERRED WATER SUPPLY OPTIONS

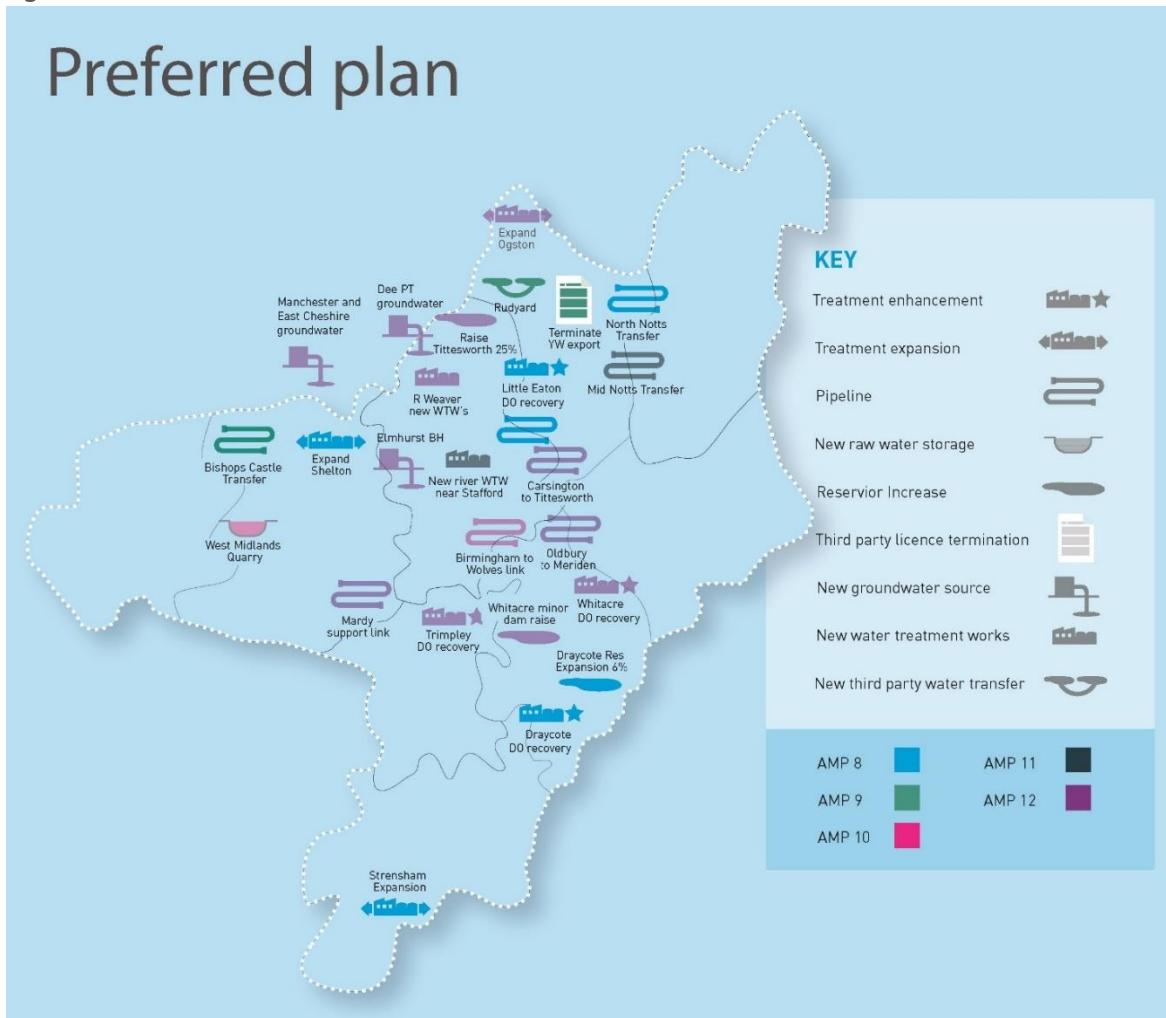
Our preferred plan promotes options that make best use of existing sustainable sources of supply, an approach that was supported by our customers and stakeholders. We have described how the challenges around long term sustainable abstraction predominantly affect our groundwater sources of supply. As a result, we have very few feasible options to increase groundwater abstraction. Instead, our feasible options generally feature increased use of our existing reservoirs and river water treatment works along with new infrastructure to distribute that water to areas of need.

Tables 5.1 to 5.6 summarise the preferred new supply options that feature in our WRMP24 to maintain supply and demand for water between now and 2050. The options prioritised for AMP8 and AMP9 are considered to be no/low-regret options that would be needed in multiple potential future scenarios. The need for these options is driven by the impacts of the EA abstraction licensing policy to prevent deterioration of WFD status and to ensure we can achieve the required 1 in 500-year drought resilience standard. These same AMP8/AMP9 options also feature in our 'Ofwat core' pathway and our PR24 business plan.

For more information about the stages we have gone through to assess our potential supply and demand options, and the evidence we have gathered to give confidence in the solutions that we are recommending in our WRMP24, please see Appendix E. Appendix G describes in more detail our preferred plan to accommodate the most likely future changes in supply and demand for water, whilst also maintaining flexibility to adapt to future uncertainties.

Our preferred plan selects a range of supply side schemes to complement our demand management programme to deliver the best value long term plan for our customers and the environment. Figure 5.2 below provides an overview of the wide range of scheme types and geographic spread across our region, with further details provided in tables 5.1 to 5.6.

Figure 5.2: Our Preferred Plan



Schemes marked with an * in tables 5.1 to 5.6 are internal transfers, and the benefit per day shows the maximum expected utilisation in the planning period.

BETWEEN 2025 AND 2030

The best-value supply options as per our preferred plan for AMP8 are detailed in Table 5.1.

Table 5.1: Best-value supply options in AMP8

Scheme Name	Benefit (per day)
Transfer from Strategic Grid to Notts	30 million litres*
Carsington to Tittesworth transfer	30 million litres*
Expand Strensham Water Treatment Works	15 million litres
Expand Shelton Water Treatment Works	18 million litres
Expand Draycote Reservoir	9 million litres
Increase output from Draycote Water Treatment Works	4 million litres
Increase output from Little Eaton Water Treatment Works	5 million litres

BETWEEN 2030 AND 2035

The best-value supply options as per our preferred plan for AMP9 are detailed in Table 5.2.

Table 5.2: Best-value supply options in AMP9

Scheme Name	Benefit (per day)
End Derwent Valley export to Yorkshire Water	35 million litres
An internal import to Bishops Castle	1 million litres*
Rudyard Reservoir C&RT transfer	6 million litres
Start work on West Quarry scheme	n/a

In the longer term, some of the recommended scheme options are more complex to deliver and their costs and benefits more uncertain. Our PR24 business plan will include the costs of continuing to develop the feasibility of these longer-term options in order to make sure that they are deliverable in the time required. We will also continue to explore opportunities to accelerate these schemes to bring forward benefits.

BETWEEN 2035 AND 2040

The best-value supply options as per our preferred plan for AMP10 are detailed in Table 5.3.

Table 5.3: Best-value supply options in AMP10

Scheme Name	Benefit (per day)
West Quarry Scheme	33 million litres
Birmingham to Wolverhampton Transfer	10 million litres*
Start work to raise levels at Tittesworth by 25%	n/a
Start work to provide a new Water Treatment Works near Stafford	n/a

BETWEEN 2040 AND 2045

The best-value supply options as per our preferred plan for AMP11 are detailed in Table 5.4.

Table 5.4: Best-value supply options in AMP11

Scheme Name	Benefit (per day)
New Water Treatment Works near Stafford	23 million litres
Continue work to raise levels at Tittesworth by 25%	n/a
Start work on new Water Treatment Works at River Weaver	n/a
Start work on new source – Manchester and East Cheshire	n/a
Mid Nottinghamshire Transfer	30 million litres*
Start work on new groundwater source - Dee Sandstone	n/a

BETWEEN 2045 AND 2050

The best-value supply options as per our preferred plan for AMP12 are detailed in Table 5.5.

Table 5.5: Best-value supply options in AMP12

Scheme Name	Benefit (per day)
Mardy transfer support link	3 million litres*
Recommission groundwater source at Elmhurst	2 million litres
Carsington to Tittesworth transfer (phase 2)	14 million litres*
Complete Tittesworth Reservoir storage increase 25%	14 million litres
Complete work on new Water Treatment Works on River Weaver	20 million litres
New source – Manchester and East Cheshire	5 million litres
Start work on new Water Treatment Works in Nottingham on River Trent	n/a
Complete new groundwater source - Dee sandstone	5 million litres
Increase output from Whitacre Water Treatment Works	4 million litres
Dam extension at Whitacre	3 million litres
Oldbury to Meriden transfer link	6 million litres
Increase output from Trimley Water Treatment Works	4 million litres
Expand Ogston Water Treatment Works	15 million litres

BEYOND 2050

The best-value supply options as per our preferred plan beyond 2050 are detailed in Table 5.6.

Table 5.6: Best-value supply options beyond 2050

Scheme Name	Benefit (per day)
Ruyton support link	3 million litres *
Complete work on new Water Treatment Works in Nottingham on River Trent	30 million litres
West Midlands Raw Water Storage	33 million litres
New groundwater source near Soar	5 million litres
Increase output from Mythe Water Treatment Works	10 million litres
Increase output at Milton source	5 million litres
Blackbrook Reservoir	8 million litres
Increase output from Homesford Water Treatment Works	5 million litres
Eyebrook Reservoir	18 million litres
Carsington expansion	110 million litres
Hallgates to Oldbury transfer link	9 million litres
Increase output from Campion Hills Water Treatment Works	2 million litres

Alternative Pathways

Alongside our preferred plan we developed alternative pathways that we may need to move to if the future supply demand situation is different from the one described in our preferred plan. A summary is provided in table 4.2 above and further detail is in Appendix G.



PROTECTING THE WATER ENVIRONMENT

The measures set out in our WRMP24 will protect and improve the water environment. This plan builds on the commitments we already made at WRMP19 to help achieve WFD goals by reducing unsustainable abstraction and reducing abstraction licences to prevent future environmental deterioration. For example, in our WRMP19 we committed by 2030 to reduce our Nottinghamshire groundwater abstractions by 23.5MI/d and to forgo up to 88MI/d of spare licence capacity in the surrounding aquifer.

The long-term environmental destination delivered by our WRMP24 goes way beyond the commitments described in WRMP19. This plan represents a step change in our proactive approach to protecting and improving the future water environment. In particular, the proactive abstraction licence reductions we have included in our preferred plan will help to achieve the government's ambitions of:

- Bringing at least three quarters of England's waters close to their natural state as soon as practicable.
- Reducing the damaging abstraction of water from rivers and groundwater.
- Reaching or exceeding objectives for rivers, lakes, coastal and groundwaters that are specially protected, whether for biodiversity or drinking water as per the River Basin Management Plans.

Whilst these abstraction licence reductions have a material impact on our water supply and demand investment, our environmental destination approach is broader than this and we propose to take actions aimed at mitigating multiple pressures affecting the water environment, not only abstraction pressures, and to work in partnership with others where possible.

Our environmental destination has been informed by the WRW regional stakeholders who have worked with us to address issues at a catchment scale. Working with WRW, we have shared potential future environmental destination scenarios with stakeholders to gauge their preferences and priorities. The WRW environmental destination vision is as follows and reflects feedback from those events and consultation responses:

"OUR VISION IS FOR AN ENHANCED WATER ENVIRONMENT, WITH ABUNDANT NATIVE SPECIES AND FUNCTIONING HABITATS, SUPPORTING WELLBEING AND THE REGIONAL ECONOMY. TO DELIVER THIS VISION, WRW WILL CHAMPION THE NECESSARY ACTIONS FOR OUR WATER RESOURCES AND FACILITATE MULTI SECTOR WORKING TO ACHIEVE THEM. OUR PLAN WILL DESCRIBE ACTIONS BY OUR MEMBERS, STAKEHOLDERS AND REGULATORS TO DELIVER NET GAIN, DELIVER ENVIRONMENTAL RESILIENCE AND AVOID DETERIORATION."

Achieving this vision for an enhanced water environment will involve reducing the volume of water abstracted, improving water quality, and restoring habitats. In England, such abstraction reductions will need to be implemented by 2050 and these are mainly driven by the National Framework requirements. In Wales, water companies are proposing to include a programme of investigations delivered via the Water Industry National Environment Programme (NEP), designed to improve their understanding of how to achieve long term sustainable abstraction, in order to meet the enhanced biodiversity duty, as defined under Section 6 of the Environment (Wales) Act. Whilst the National Framework requires us to tackle future water abstraction, improving water quality and flows were top of the agenda for stakeholders who wish to see us address these issues via catchment management options.

Our water supply and demand options are primarily identified to improve water resource resilience, but we do consider in their design how they might contribute to water quality wherever possible. In addition, we are looking to implement a range of catchment solutions across England and in Wales that will support wider issues such as water quality.

In many waterbodies abstraction will be capped at recent rates, to avoid future deterioration. For us these abstraction licence caps particularly affect our groundwater sources of supply. Our surface water sources are also impacted by climate change with the hands-off flows occurring more frequently, reducing the amount of water we can take for

supply. Abstraction from both may need to reduce to improve river flows, meet WFD targets and adapt to less water being available due to climate change. In the areas affected, the new supply options that we describe in this plan will provide alternative ways of meeting customers' demand for water.

Overall, our WRMP24 includes abstraction licence and abstraction changes that will result in the deployable output reductions summarised in Table 5.7. These future abstraction changes are based on our existing 2030 environmental commitments, our understanding of the EA's latest abstraction licence capping policies and the National Framework's long term environmental destination goals. The leakage reduction, metering, water efficiency and water supply investment described in our preferred plan are all required to accommodate these future abstraction reductions.

Table 5.7: Summary of water resource zone deployable output reductions (Ml/d) in WRMP24

Resource Zone	Early regulatory needs, 2030 to 2040			2050 BAU+
	2030/31 1:200 Drought LOS	2035/36 1:200 Drought LOS	2040/41 1:500 Drought LOS	2049/50 1:500 Drought LOS
Bishops Castle	0.00	-1.40	-1.40	-2.16
Chester	0.00	-0.08	-0.08	-0.08
Forest and Stroud	-0.16	-0.38	-0.06	-5.43
Kinsall	-0.21	-0.21	-0.49	-0.49
Mardy	-0.74	-0.74	-0.74	-3.31
North Staffordshire	-11.50	-18.73	-19.68	-95.57
Ruyton	0.00	-0.78	-0.78	-1.27
Shelton	-31.00	-35.00	-35.00	-78.49
Stafford	-0.30	-2.82	-2.82	-16.33
Strategic Grid	-41.45	-65.20	-43.79	-94.09
Whitchurch & Wem	-3.78	-3.78	-3.78	-3.96
Wolverhampton	-0.08	-3.24	-3.58	-19.33
Newark	0.00	0.00	0.00	-1.44
Nottinghamshire	-34.82	-54.76	-36.78	-96.36
Rutland	0.00	0.00	0.00	0.00
Total	-124.04	-187.39	-148.96	-418.29

Note: Table summaries of two levels of service (LOS) for drought resilience. A 1:200 LOS is assumed up until 2038/39 changing to a 1:500 LOS from 2039/40 onwards. Further information on this can be found in Appendix I.

In addition to reducing our future abstraction quantities, we will also carry out the following activities to help achieve our long-term environmental destination goals:

Improve our understanding of ecological needs

While we have used the EA's National Framework data to inform the environmental destination scenarios, these are early assessments of how much water abstraction might need to reduce to achieve future environmental goals. There is uncertainty around the precise abstraction changes that might be needed in the future, and there is uncertainty around the most effective solutions to achieve the long-term goals. For example, it may be that in some catchments the assumed reductions in groundwater abstraction will not be sufficient to support surface water flow targets, while in other catchments it may be that reducing groundwater abstractions could lead to increased flood risk. To reduce the uncertainty around the long-term environmental destination needs and solutions, our PR24 business plan includes investment to carry out detailed environmental investigation programmes over 2025-2030 to gather the evidence needed to improve confidence in the long-term solutions. These investigations will consider:

- Potential climate change impacts on water ecology.
- Hydro ecology requirements in specific catchments.
- Catchment resilience needs and balancing this against the resilience needs of water supply across sectors.
- Opportunities to deliver multiple benefits in conjunction with other projects in the same catchment.
- The need to maintain affordability for customers.

These investigations will also bring the opportunity for us to identify synergies and areas of mutual benefit with other plans and programmes.

We plan to use more catchment specific hydro ecology models or other frameworks to refine the data on the flows that are required to support a healthy ecosystem and to better predict how and where protection is likely to be needed in a changing climate.

The outputs of these investigations will inform our 2029 and 2034 WRMPs and help us understand whether we can have confidence in the longer-term supply and demand investment described in our current preferred plan or whether we are more likely to follow one of our alternative pathways. Our approach to long term environmental destination provides a clear example of how adaptive pathways thinking can inform long term water resources investment planning.

Work with partners in priority catchments

During 2025-2030 we propose to work with stakeholders to bring environmental improvements and ecological resilience in two priority catchments. During 2021 we engaged with WRW's stakeholders to prioritise the catchments for improvement across our region. The prioritisation work was used to assess what needs to be achieved in the longer-term environmental destination and identify short term no regret options that could be implemented in the near future.

The prioritisation work has identified two priority catchments in our supply area, the Idle and the Worcestershire Middle Severn; these catchments also have public water supply abstractions for Anglian Water and South Staffs Water, and we have worked with these two other water companies to develop our approach. Having identified these two priority catchments we have then done more detailed work with local stakeholders, and we have developed the first iteration of a water resource focused catchment plan which prioritises multiple benefits.

Through this iterative stakeholder engagement process we have identified fifty potential catchment enhancement options that could benefit these priority catchments. We then shortlisted these down to four preferred catchment enhancement options (see Table 5.8) and we have included these as Environmental Destination schemes in our PR24 business plan WINEP. We will work with stakeholders in the catchment to refine the options. If better water resource options are available we will implement alternatives; these will be used as trials to inform future catchment measures to be adopted to enhance water resources catchment resilience.

Table 5.8: Catchment enhancement options for our priority catchments

ID	Option Description	Benefits	Risks
Idle_43	Poulter & Clumber wetland and flood meadow restoration with natural flood risk management and aquifer recharge	Improves water quality, flood management, biodiversity. Enhanced recharge - trade off against future reductions.	Water resources benefit uncertain: how much could recharge be enhanced? GW body will remain poor.
Idle_41	Rainworth Water wetland creation as part of local CaBA masterplan	Improved water quality, habitat, hydro morphology. Enhanced recharge - trade off against future reductions. Improved flow regime in Rainworth Water.	Landowner permission required. May require protected species and archaeological surveys
WMS_02	Worfe on the Wild side extension and Worfe Water Environmental Improvement Fund for sedimentation control, fish barrier removal and tree planting	Improve ecological resilience. Reduced sedimentation. Improved access for fish. Improved water quality.	None known
WMS_39	Bromsgrove Brooks extension	Improved hydro morphology. Improved ecological resilience. Flood alleviation. Wetland creation – biodiversity, Water vole habitat. May include alternative approaches to improving flow regime or enhanced recharge that may be traded off against future abstraction reductions.	None known

As well as focussing on these two priority catchments we have scoped out a large-scale investigation programme to evaluate catchment specific opportunities and stakeholder engagement to build catchment improvement plans and they are included in the PR24 WINEP for 2025-2030. These are summarised in Appendix D.

We will also bring wider catchment improvements across our region, through schemes to be implemented for other environmental drivers, as part of our AMP8 WINEP commitments. A summary of these activities is included in Appendix D.

There are also non-public water supply abstractions in these catchments and WRW has carried out an initial evaluation of the scale and sectors across the WRW region. Changes to abstraction licences are also likely to be required to achieve the environmental outcomes in catchments. We are exploring how this evaluation will be done and will need to factor this into our investigation and options appraisal programme for our sources.

Continue to restore rivers to improve habitats and ecological resilience to low flows.

Our WRMP24 continues the programme of river restoration that we began in WRMP19 and includes short and long-term measures to remove or offset the environmental impacts of abstractions and to help the associated water bodies achieve WFD objectives. In the short term we propose localised environmental protection measures that will allow us to continue to abstract from some sources until we can put longer term solutions in place to reduce or stop abstraction.

In water bodies where local environmental protection measures could work as mitigation for abstraction impacts, our aim is to engage with local stakeholders and landowners and build on the networks that already exist, such as Catchment Based Approach (CaBA) partnerships. We will also work with these networks throughout the planning and delivery of these measures. The localised environmental measures that we propose include:

- **Local flow support measures**

These types of options involve providing additional water to localised river reaches in times of low flow. This can be achieved in river reaches below reservoirs by releasing water into the river to ensure flow does not get too low and by providing some variation in the amount released through the year. In rivers that are not downstream of a reservoir water can be added from another source, such as groundwater if available.

- **Catchment and river restoration improvements**

Many streams suffer from a range of problems that exacerbate the impacts of low flow, such as modification of the channel, lack of in-stream habitat, pollution, sedimentation, and barriers to the movement of fish. Reducing abstraction without also addressing other issues in the waterbody will only provide limited benefit, whereas improvements in stream habitat will improve the stream in the short term and also enhance the environmental benefit of the longer-term reduction in abstraction.

Our river restoration aims remain the same as last AMP, to plan and develop a package of improvement measures in each of the affected waterbodies in collaboration with the relevant groups, landowners and other organisations working in the area. Our aim is to ensure we build on programmes that are already being planned or are underway to avoid duplication and enhance environmental outcomes. We are using nature-based solutions to address issues in the affected waterbodies. We will also look for opportunities to achieve multiple benefits such as biodiversity and public amenity where possible. The main types of environmental improvements that could be made to waterbodies include realignment and changes to make the shape of the water course more natural, in-stream measures to improve the diversity of habitat types, riparian management such as fencing and buffer strips to reduce nutrients and sediments entering rivers, and fish passes and removal of in-stream barriers. Where supported by our catchment partners and evidence we will also consider other types of wider catchment environmental improvements if they will improve in-stream flow or water quality such as creation or restoration of wetland habitats or woodland/other plantings.

In the period 2020-2025 we are delivering 11 environmental measures schemes. The driver for these projects is to improve ecological resilience to low flows. There are 11 catchments which include 17 waterbodies where we have an obligation to deliver environmental measures. Each of these catchments have been investigated for multiple AMPS (in terms of river flow, macroinvertebrates etc) to understand the impact of our groundwater abstraction on surface water flow. Where our groundwater abstraction is impacting surface water bodies, we have included in WINEP for a solution to be implemented.

The sites which these schemes are being delivered at are as follows:

● Cinderford Brook	● Strine
● River Sherbourne	● Lower Worfe
● Aldford Brook	● Henmore Brook
● Vicar Water	● Doverbeck
● Rainworth Water - Bevercotes Beck	● Batchley Brook

We have established a new partnership delivery method with eNGOs such as Wildlife and River Trusts for our river restoration activity. We are formally in partnership agreements with Trusts to deliver this work. This partnership working with local Trusts and the EA will ensure successful delivery of these schemes by the end of AMP deadline and also provide many other benefits in terms of expert local knowledge, local stakeholder and engagement benefits.

Using agricultural catchment management to improve biodiversity and protect drinking water supplies.

Our drinking water protection strategy is, where possible, to use catchment management techniques to reduce the number of drinking water failures and minimise or delay future water treatment expenditure on raw water quality deterioration. This will be achieved through collaboration with EA, DWI and Ofwat along with other key stakeholders and catchment partnerships. It will also deliver our obligations under the WFD, further enhance catchment risk assessments that support our drinking water safety plans (DWSPs) and reduce carbon usage.

Over the last 15 years our catchment management programme has been both ambitious, covering the whole of our region, and pioneering, one of the first such programmes in the country. We undertake catchment investigations and deliver improvement schemes in both surface water and groundwater catchments. This programme of work has allowed us to manage water quality risks in a sustainable and cost beneficial manner in accordance with the regulatory requirements of Article 7 of the Water Framework Directive and Water Supply (Water Quality) Regulations.

Examples of our ongoing catchment management activities are detailed below.

Farming for Water

Our Farming for Water initiative works directly with farmers to deliver a suite of integrated environmental solutions, all with the aim of protecting water at source, improving river health and drinking water quality. We're unique in our approach to catchment and land management, working with over 6,000 farmers to date, we have provided over 2,000 grants. This has been enabled through relationship-based management - working with agricultural partners, stakeholders, farmers, landowners, estate managers and many others.



Severn Trent Environmental Protection Scheme – STEPS

Our long-standing grant programme STEPs (Severn Trent Environmental Protection Scheme) has been running for ten years and offers grants to farmers and landowners to undertake works which will help reduce water quality risks at our abstractions. There are a wide variety of interventions available to choose from, including innovation options which are designed to deliver reduced runoff of pesticides, nutrients, and cryptosporidium. To help achieve our commitment to improve 5,000 ha's of land for biodiversity, we have an additional suite of STEPS interventions aimed at enhancing biodiversity on farm.

To date we have funded 923 grants, totalling over £5.5m of environmental work being undertaken on farms since 2020. This has resulted in reductions of 21,129.70 kg of nitrate; 1,614.76 kg of pesticides and 1,653 ha's of biodiversity created over the last five years, negating the need for £74 million of investment in our treatment processes.

SOFA – Specialist on Farm Advice

Our grants and schemes are supported by a range of 11 specialist visits that we provide for free. This range offers free technical advice and support alongside the opportunity to apply for the grants and take part in our schemes. Specialists deliver the visits alongside the farm's local agricultural advisor, before providing a comprehensive report and recommendations with links to our funding opportunities and those through our partners. Examples of potential specialist farm advice visits include:

- Soil Sampling & Nutrient Management.
- Woodland Condition Assessment.
- Pesticide Washdown and Biobed/Biofilter advice.

Swap your Nozzles – a low drift nozzle scheme

The biggest tool for many farms in crop protection is their crop sprayer and the variety of equipment that goes with it. Farmers need all the right tools to do the job, and this includes using plant protection products that are needed to grow healthy and sustainable crops.

We want to protect water quality as much as possible at source and we know that simply using low drift nozzles should reduce pesticides reaching watercourses, but sprayer nozzles are far more complicated than that. Following our successful Swap Your Nozzles launch event in 2021, we have since held a further series of events, giving lots more farmers and contract spray operators the chance to sign up to our online workshops to swap their nozzles.



6. HOW CUSTOMERS AND STAKEHOLDERS HAVE SHAPED OUR PLAN

Customer and stakeholder engagement at all stages has been a critical part of the development of our plan. Our customers and stakeholders have provided a clear steer on their expectations, which has been used to inform our approach. A summary of how we have worked with customers and stakeholders is outlined below and further detail is provided in Appendix H.

CUSTOMER ENGAGEMENT

Our WRMP24 is founded on a rich programme of customer insight representing over 20,000 customer interactions, undertaken both locally and in collaboration with WRW companies. Our full approach to Customer Engagement, including our strategy and the specific research undertaken are detailed in Appendix H.

Building on our insight from customers for WRMP19, our recent research has taken place over a couple of years of great societal change, and we have seen a shift in customers' concerns from the impact of the COVID-19 pandemic to the political and media focus on the impact water companies have on the environment, to the cost of living crisis which has emerged strongly in 2022/23. Within this context, and despite a growing concern about climate change, water remains a low salience topic for customers and the future stresses on water supply are not well known or understood.

Our approach for WRMP24 takes into account:

- Ofwat and CCW expectations, and in particular proportionality, collaboration and ensuring the research is meaningful to customers.
- Expectations from the EA on customer engagement for WRMP24
- The scope for customer insight to shape the plan.
- Our legacy – we are not starting from scratch, we are building on an extensive programme of research over the last five years, both for the WRMP and price review but also our significant programme of continual research.

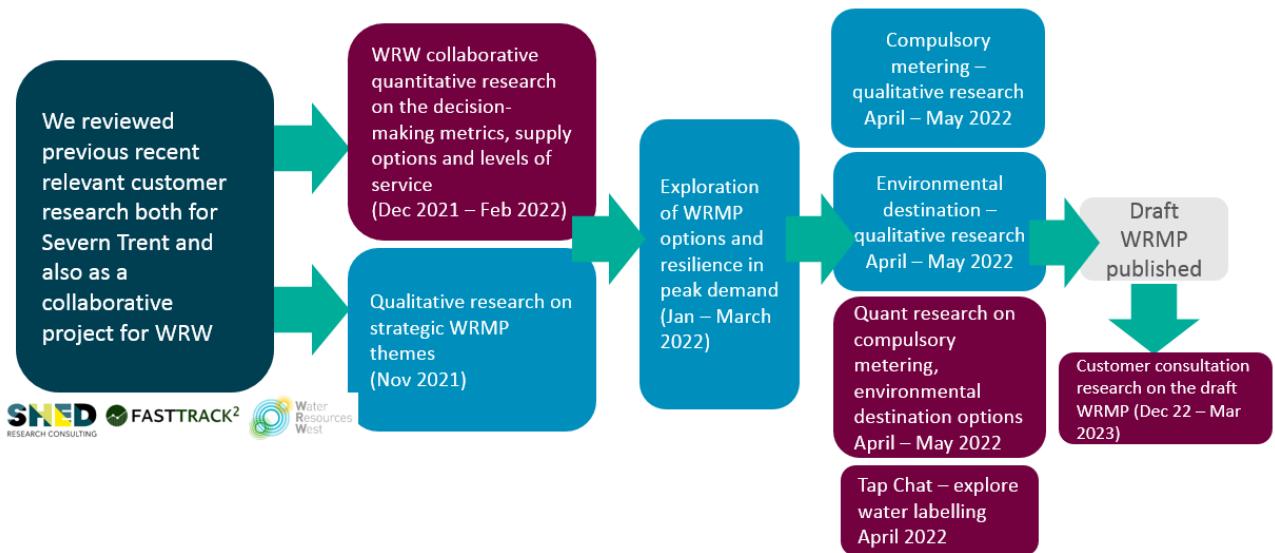
There are five key elements to our WRMP24 insight strategy, as outlined in Figure 6.1

Figure 6.1: The five key elements of our WMRP24 customer engagement insight strategy

				
Materiality	Reasoning	Better use of data	Collaboration	Meaningful
We place the most focus on where our research can make a material difference to our plans focusing on investment proposals, long term ambitions and bespoke PCs. This complements our approach to the Expert Challenge Panel	We will use high quality, well-chosen sources of insight, continuing to use the 4-box model designed with the CCG to inform insight method and the concept of a hierarchy of needs to better understand choices and trade-offs.	We will continue to develop our other sources of insight including our understanding of operational data, behavioural science, and data science.	We will pursue opportunities to collaborate with others including South Staffs Water and with Water Resources West	We are taking the learning from CCW's report on Engaging water customers for better outcomes and ensure every project considers how the topic and materials have been made meaningful to participants

Our programme of work to inform the WRMP has followed a number of steps as outlined in Figure 6.2.

Figure 6.2: Customer engagement programme of work



Throughout the process we have engaged with CCW to get challenge on our approach and findings, alongside the launch of our Expert Challenge Panel in May 2022.

What customers have told us?

Meeting the challenges of climate change and drought to ensure there is enough water for everybody is a key priority for customers, although not something which is front of mind. When it comes to how we address the supply demand deficit, customers continue to want to see a focus on demand side solutions, followed, where necessary, by supply schemes. Helping customers to use less water resonates strongly with customers and they recognise that they have a role to play here, and yet promoting behaviour change is complex, and many do not appreciate the link between water usage and the environment, or the link between water consumption and energy use in the home.

Following our classification as a water stressed area we have talked to customers about compulsory metering. This can be a polarising subject amongst those who aren't metered, however, once informed, there is a reasonable level of support with 58% of customers supporting a compulsory metering programme and 22% neither supporting nor opposing it. The need to reduce water usage to counter the future supply demand deficit and protect the environment are felt to necessitate this approach, but there remain concerns about the compulsory nature and the uncertainty about bill impacts, including the financial impact on low-income families.

Protecting and improving the environment is important to customers, although the link with the water supply is not very clear, particularly the impacts of abstraction on the environment. Customers are mixed in their views of how fast we should tackle the long-term environmental destination, with a slight preference for an adaptive approach.

In table 6.1 we have summarised the key insight from our customers, and how that is reflected in the WRMP24.

Table 6.1: A summary of key feedback from our customers and how this has influenced our plan

What our customers told us	How our WRMP24 is influenced by customer views
Meeting the challenges of climate change and drought to ensure there is enough water for everybody is a key priority for customers.	Our modelling is based on the UKCP18 datasets and we're working to the RCP6.0 climate change scenario, which factors in the potential changes to temperature and precipitation patterns that we may see in our region. We've also modelled a range of other potential climate futures, which allows us to choose the best solutions that are consistently identified as no regrets options within these futures, both in the short term, and to allow for adaptive planning for future options in the long term, depending on the climate scenario that's realised.
Consumers don't consider TUBs (Temporary Use Bans – also known as hosepipe bans) and NEUBs (Non-Essential Use Bans) to be particularly impactful measures, and current levels of service are acceptable to the majority of customers.	We will maintain our current levels of service.
The majority of customers find the proposed 1 in 500-year level of drought resilience by 2039 acceptable, and recognise that drought measures would be a last resort in exceptional circumstances.	We will plan to the 1 in 500-year level of resilience.
The overwhelming majority of customers say it is very important or important to protect the environment.	This is a huge subject area covering multiple elements of the work that we're undertaking. All our options and schemes involve a full environmental assessment. We're looking at both supply side and demand side commitments, including a 50% reduction in leakage and helping customers to reduce their usage to ensure that we minimise the amount of water that we need to take from the environment. See below for more information on our Environmental Destination Programme
Customers are mixed in their views of how fast we should tackle the Environmental Destination challenge, with a slight preference for an adaptive approach.	We have included the current regulatory needs early in the plan and have assumed that the Environmental Destination is achieved by 2050 in our main plan. We have also run alternative scenarios that consider if it could be delivered earlier as part of our adaptive plan. We are proposing a comprehensive investigation and options appraisal programme, to reduce uncertainty, which will underpin future water resource plans.
Overall our customers have been supportive of compulsory metering, driven by the need to solve the future deficit and protect the environment. They recognise the additional benefits which would come from AMI metering. This is however still a polarising issue and there remain concerns about the compulsory nature and the impact on bills for families and those more vulnerable.	We are continuing with our ambition from WRMP19 for universal metering by 2035, but with a move to a compulsory programme utilising AMI technology to maximise the benefits to both customers and demand management. We remain committed to provide support to vulnerable customers through various schemes such as 'The Big Difference' implemented in AMP7. Further information

	on what support is available for customers can be found in Appendix H.
Whilst affordability and water quality are top of mind priorities for consumers, the environment and the importance of water efficiency are also spontaneously identified as key areas of focus.	We will continue to offer these services to customers and engage with them on water efficiency. We will also continue to evolve innovative targeting of water efficiency messaging across all of our customer base.
Customers want to see Severn Trent providing information, free/discounted products, services and incentives to reduce consumption, and generally taking a lead supporting customers to change behaviour.	There is also lots of tips, advice and both free and subsidised products available on our website at stwater.co.uk/save
We asked customers about water efficiency labelling for domestic appliances, such as washing machines, and what factors would be most important when buying a new appliance. 64% of respondents ranked water consumption in their top three, following energy consumption (90%) and cost (81%). The vast majority of respondents (81%) wanted to see this implemented in the next two years.	We have lobbied hard through both Water UK and Waterwise to encourage the Government to introduce mandatory water labelling and minimum standards within water fittings and building regulations. They have stated that they are introducing this in 2024 and we strongly support this. We have included the benefits of this scheme from 2025.
Leakage has always been a key issue for customers. Throughout our research and customer interactions they repeatedly express concern about the amount of water that is lost through leakage.	We have made a commitment to reduce leakage by 50% by 2045, five years ahead of government targets.

STAKEHOLDER ENGAGEMENT

We have held direct stakeholder discussions and consultation activities to inform our WRMP24. We have had regular stakeholder meetings where we have shared the emerging direction of travel, information and challenges, and we have asked our stakeholders to discuss with us the matters which are most important to them. Unlike previous WRMPs, we've also done a significant proportion of our stakeholder engagement at a regional scale through Water Resources West and the associated regulatory groups.

The types of groups we have regularly engaged with throughout the development of this plan include:

- Environmental Regulators such as the Environment Agency and Natural Resources Wales.
- Other Regulators such as Ofwat and CCW.
- Neighbouring Water companies and third parties.
- Regional Groups.
- Retailers and NAVs.

For our work on Environmental Destination, we have consulted with key stakeholders such as the EA, local Wildlife Trusts, Severn Rivers Trust, NFU, North Worcestershire Water Management, Anglian Water, South Staffs Water and the Internal Drainage Board / Water management consortium.

Pre-Consultation

In addition to these regular and ongoing commitments we, and WRW, concurrently did a pre-consultation exercise in early 2022 to share details of the early emerging plan, our approach and to seek early feedback to inform the development of our plan.

Our pre-consultation provided the opportunity to engage with 202 consultees, including our non-statutory consultees, other water companies with whom we have bulk supply or shared resource agreements, local catchment partnerships and CCW. We also carried out a more in-depth enhanced pre-consultation with the Environment Agency, Natural Resources Wales and Ofwat.

Formal Consultation

Our formal consultation period began on 14 November 2022 when we published our dWRMP on our public-facing website. Consultation was open for customers, stakeholders and regulators to give their views and closed on 22 Feb 2023. Three stakeholder events were held in November and December 2022, with invites going to 272 people from 105 organisations. Two events were held online and one in-person event at our Coventry offices. In total 55 people attended from 34 organisations and we discussed not only what was in the dWRMP, but also how we could work together and develop ideas around particular topics, including demand management, supply scheme options and protecting and enhancing our environment.

Alongside those workshops, we've run a program of stakeholder engagement, from weekly and monthly meetings for some, to single meetings where stakeholders told us they didn't require any more. We did this throughout the consultation period with all key stakeholders. We've also held various stakeholder workshops on specific subjects to see how we can work together on joint projects to solve issues.

Overall, we saw positive feedback around how our documents were constructed. For example, the Consumer Council for Water (CCW) said: "The explanation of the Demand and Supply options is clear and easy to understand. There is a well-written and informative customer quick guide that explains the problems that the region is facing and the company's plans to address them. The quick guide is clear; written in an easy-to-read manner."

Our customer and stakeholder engagement has been done in conjunction with our business planning teams who are developing our PR24 business plan. This will ensure that what we have learned will be reflected in our Business Plan.

More details about the content and approach to consultation, and how we have engaged with various different groups throughout the development of this plan, are available in Appendix H.

We have received a large amount of helpful feedback through our various stakeholder engagement activities. We have used this feedback to help shape our plan. We also used it to guide our customer engagement activities. Some of the key messages which we've heard most frequently are outlined in table 6.2.



Table 6.2: Summary of stakeholder feedback and how we have built this into our plan

Key stakeholder messages	How we have built this into our planning
A greatly increased focus on the environmental impact of abstraction and how this can be minimised	We have developed a future plan which accommodates WFD requirements, licence capping and stakeholder ambition regarding long term environmental destination. More detail on this is provided in Appendix D
Significant support for increased catchment management activity, working together with other water users on catchment approaches and how we can use this to support water availability for all users	We are committed to continue to build on our successful catchment management approach delivered through AMP6 and AMP7, and partnerships with landowners and stakeholders. Consequently we are seeking to explore further opportunities for catchment measures with stakeholders to bring catchment improvements and ecological resilience without destabilising public water supplies. More detail on this is provided in Appendix D
ST should focus on challenging leakage reduction and demand management activities	<p>Our proposed approach for leakage, which sees us continue the pace of leakage reduction we have delivered in AMP7 on our path to deliver 50% reduction by 2045, five years ahead of Government targets, was generally well received and we thank stakeholders for their support. A number of stakeholders did however challenge this ambition and questioned should we go further and faster, where others challenged our ability to deliver this level of ambition. The plan we have set out is very ambitious, with innovation needed to achieve the full reductions by 2045 and maintain leakage at that low level. As we deliver our WRMP over the coming years we will accelerate this programme of work and/or achieve greater reductions if the technological, environmental and economic case for our customers justifies further reductions. We have a good track record on meeting our leakage reduction targets, achieving them in 11 out of the past 12 years. Our plans for AMP8 will see a further 16% reduction.</p> <p>We received a lot of support for our demand ambition directly through consultation responses and at our stakeholder events. However, there were several questions around pace, delivery and a challenge to go even further, especially in our ambition on non-household demand reduction. In contrast we also received challenge regarding the dependence our plan placed on demand side measures and their deliverability, especially reducing customer demand.</p>
There was clear support for our proposed levels of service, including a 50% reduction in leakage by 2045, TUBs frequency of 1 in 33, 1 in 500-year drought resilience by 2039 with no reliance on drought permits/orders.	We have developed a plan which will enable us to continue to deliver against these commitments
Real support for working with our neighbouring water companies, using consistent assumptions and methodologies to create a Regional Plan	We have been actively involved, and highly influential in Regional Planning, both as members of WRW and by providing resource to support the delivery of the programme. Our plan is aligned with the WRW plan and we have applied the same assumptions and methodologies as the other member companies

Backing for sharing water resources outside of the ST region	Our WRMP24 has been developed in close conjunction with both the Regional Plan and the SROs, facilitating water transfers whilst continuing to meet the needs of our own customers
A greatly increased focus on the environmental impact of abstraction and how this can be minimised	We have developed a future plan which accommodates WFD requirements, licence capping and stakeholder ambition regarding long term environmental destination. More detail on this is provided in Appendix D
Moving to compulsory metering from 2025	We remain committed to our long-term ambition from WRMP19 to achieve near full metering coverage by 2035. In our dWRMP we set out how we intend to build on the proactive programme of metering we started in 2020 and move to a compulsory metering programme from 2025. Through both our customer research and consultation feedback from stakeholders, the overall response was positive and supportive of the switch to compulsory metering, which will continue to feature in our final plan. Key concerns raised related to the need for supporting customers who struggle to pay because of increases in their bills after moving to metered charges.
Upper Derwent Valley Reservoir Expansion (UDVRE) and Severn to Thames Transfer (STT) SROs	We received many comments from a wide range of consultees regarding the proposed UDVRE SRO. Key concerns raised focused on the potential impacts on protected areas, and compliance with SEA, HRA and WFD requirements. Significant additional assessment is still required for this scheme, which will be undertaken as it moves through the RAPID gated process. In our draft plan the scheme was not needed until at least 2050, which means no final decision is required in this round of WRMPs, and the more detailed SRO environmental appraisals can inform the final decision at WRMP29 or later. Through the regional reconciliation process that has continued post submission of our draft plan, the Severn to Thames Transfer (STT) has been removed from the preferred plan.
Non-Public Water Supplies (nPWS)	We received some feedback around addressing the needs of the nPWS sector and third-party needs. Although nPWS needs are not a specific component of company WRMPs, as a member of WRW, we have assessed the future nPWS requirements, including direct engagement with representatives of the nPWS sectors, including The Trust, NFU and the power sector. We are committed to supporting the regional planning process to help address nPWS needs, however Government and Regulators will need to address appropriate funding mechanisms, as regulated public water supply companies cannot cross subsidise the nPWS sector. No proposed changes are being made to our plan, however we are exploring how we support potential switching of private water supply users to public supplies.

HOW CUSTOMERS AND STAKEHOLDERS HAVE INFLUENCED OUR PLAN

Levels of Service

In our PR19 and WRMP19 research we found that temporary use bans are considered acceptable in principle and a pragmatic approach to circumstances, which would have relatively minimal impact on customers' lives. These findings are largely echoed in the research we have completed for WRMP24 at both company as well as WRW level. Recent research by CCW for England and Wales³ finds that hosepipe bans are the least important service aspect for domestic customers. In the event of a ban, people felt they would be hardly impacted as alternative solutions exist for most. Whilst water providers could manage water supply to a certain extent, people believed that water shortages were driven by environmental factors outside of their control, i.e., long periods of hot weather.

Our stakeholders were also supportive of our continuing commitment to a 1 in 33-year level of service for TUBs and NEUBs. Consequently, our levels of service remain unchanged.

As we wrote this plan, 2022 experienced an extended hot, dry weather period across the country. Although we didn't impose a TUB, many customers are seeing the reality of this playing out in the media in other areas. Although this will only have been theoretical for some participants in our earlier research who hadn't previously experienced a TUB, our more recent research showed that customers' views on TUBs haven't changed.

Drought Resilience

Customer Research shows that the majority of customers find the proposed 1 in 500-year level of resilience by 2039 acceptable and recognise that drought measures would be a last resort in exceptional circumstances.

There was a general feeling that if they were necessary and there was no alternative, people would pull together with a shared sense of collective responsibility. Research by CCW for England and Wales⁴ finds severe drought measures to be of low importance due to the extremely low probability. People were alarmed by the notion and the impact on their lives but understood that the likelihood was very low as would happen as a result of extreme weather conditions which participants could not conceive of in the UK.

In our Strategic Priorities research, participants were divided on drought resilience, with just over half saying we should meet the required 1 in 500-year level sooner, although there were some caveats based on costs and information on practicality being unknown.



Our WRMP ensures that we will meet this 1 in 500-year level of resilience by 2039, however our assessment concludes that through the actions we have taken in the past, our raw water supplies are already at a 1 in 200-year level of resilience. Our analysis indicates we will achieve 1 in 500-year resilience by 2034 through the successful completion of our supply schemes and full delivery of the demand reduction programme, including third party measures such as government water labelling.

The environment

We know from our research that protecting and improving the environment is extremely important to both stakeholders and customers. In our deliberative research⁵ we found that the overwhelming majority of customers say it is very important or important to protect the environment. In our quantitative research, 71% agree with the statement that “Protecting lakes, rivers, reservoirs, fish and other aquatic plants and wildlife is really important to me”⁶. In our discussions on Tap Chat, we find that customers want us to both minimise the damage we do and have a positive impact on the environment.

Our stakeholder feedback aligns with this sentiment, with a particular focus on minimising the impact of abstraction and increasing catchment management activity.

We have also conducted multiple studies to understand customer preferences on Environmental Destination. In general, whilst customers are highly concerned about the environment, initial views on the need to protect the environment placing greater pressure on water supply are mixed. In later studies, we found that the concern over the cost-of-living crisis had become much stronger, and affordability was high on participants’ minds. Most preferred us to take an adaptive approach to our Environmental Destination, however some preferred a more ambitious approach, feeling that the issue is too urgent not to tackle “head on”.

Our stakeholders acknowledged the need to face the environmental destination challenge, though Ofwat recognises the additional environmental and financial costs this could incur. They also stated, “We recognise you have already made significant commitments to reduce abstraction licences in WRMP19 and are set to achieve over 25% of the Environment Agency’s enhanced environmental destination by 2030.”

Our current risk and prioritisation approach means we have developed a package of measures that we propose to implement between now and 2040 to protect the environment and meet our legal commitments to prevent future deterioration. These measures range from strategic investment in new, alternative sources of supply to replace those abstractions that could cause future harm, through to local environmental protection measures that will mitigate for the effects of our ongoing operations. In the longer term, our adaptive pathways approach means we will avoid committing to unnecessary investment in the near term and we understand how our long-term investment plans may need to change as the future unfolds.

Addressing the Supply-Demand Balance

Learning about the supply demand deficit prompts a mix of reactions from customers, ranging from worried and surprised to disbelief. Across multiple studies we have sought to understand customer preferences for the balance of solutions to address the deficit. Customers believe that water companies should be taking steps to respond to the issue of water scarcity and recognise that a mix of solutions (demand and supply side) is required. Whilst there are small changes in option ranking across different deliberative research studies there is consistency in the findings that demand options should be the first port of call, followed by developing new supply schemes⁷. Since publishing our draft plan, we have done more customer research and again the findings are the same. This is also consistent with the findings at the WRW level. See figure 6.3.

⁵ Strategic Priorities research

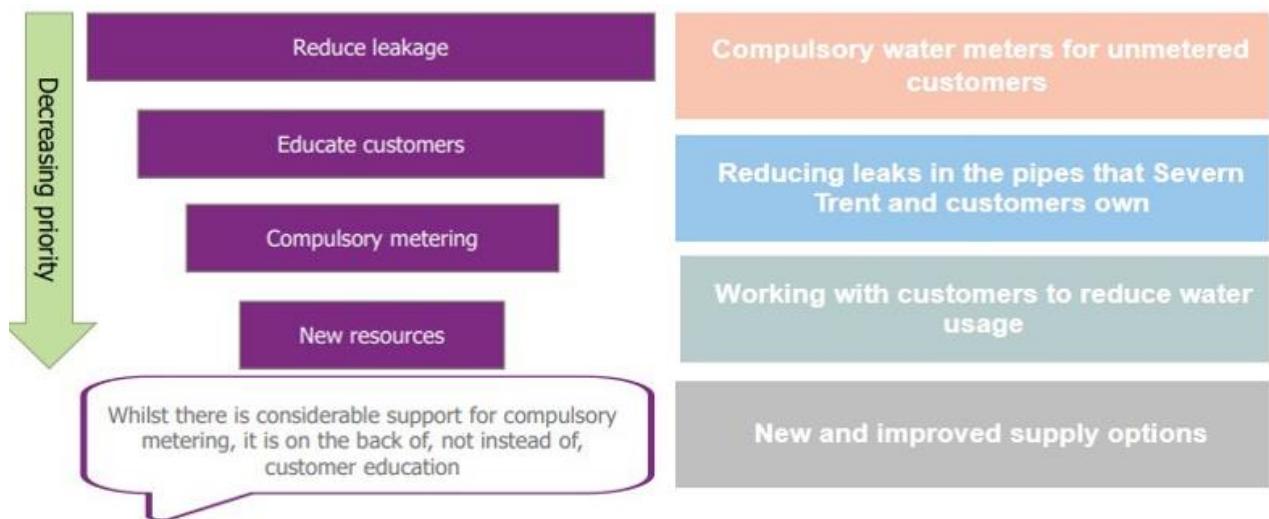
⁶ WRMP decision making metrics research

⁷ WRMP options research, Water Source Changes for the SROS, Environmental destination deep dive

- Reducing leakage consistently emerges as a strong priority, due to the importance that customers attach to this measure and their frustration with the waste of water particularly in the context of water scarcity. Leakage is highly emotive and tackling leakage is seen as a key enabler when asking customers to be mindful of their own water usage.
- In our WRMP options deliberative research we found that over the course of the research process, perceptions on supply demand options shift, and compulsory metering rises to the top – driven by the perception that it would be the most effective way to see a reduction in water consumption. There is growing acceptance that a compulsory programme may be necessary, so long as support for customers who are struggling is in place.
- Education of customers is seen as vital to reducing demand, and on the back of this there is also support for compulsory metering. Although there are some concerns about affordability (exacerbated by the current economic climate) it is generally regarded as the fairer way to pay.
- New resource options require more careful consideration, with customers recognising that they have an environmental cost, bill implications and they won't drive behaviour change.

Significantly more detail about our customers views on options to address the supply demand balance is available in Appendix H

Figure 6.3: Ranking of main supply demand solutions from two deliberative research projects



During 2025-2030 we will continue to prioritise leakage reduction activities in the zones with the greatest supply/demand balance challenges, but we will also extend our ambition into zones with a lower supply/demand balance risk. Our ambition is to reduce leakage by 50% by 2045, and we will set targets that will drive our leakage technology and innovation thinking.

We are continuing with our ambition from WRMP19 for universal metering by 2035, but with a move to a compulsory programme utilising AMI technology to maximise the benefits to both customers and demand management.

We have lobbied hard through both Water UK and Waterwise to encourage the Government to introduce mandatory water labelling and minimum standards within water fittings and building regulations. They have stated that they are introducing it in 2024 and we strongly support this.

We are also supporting customers in understanding their use and helping them to reduce usage which we will be able to target more effectively with increased metering.

Supply options

When we talk to customers about how to meet the supply/demand deficit, they recognise that supply solutions will be required alongside the preferred demand side options. Supply options are less well understood (compared to demand side options) and customers can be initially cautious when given information about them⁸.

In our quantitative research⁹ we found that indirect recycle or re-use of water was the highest ranked supply option for household customers, followed by increasing the size of existing reservoirs, maximising the output of existing water treatment assets and increasing the capacity of water treatment works. The top ranked finding felt surprising. It contradicts the findings in the research on Changes of Source carried out for a number of water companies as part of the SROs work. In this research water recycling raised the highest concern of the supply options presented and the strongest negative research. Concerns were centred on safety, quality and the environment, with many customers being particularly focused on the “yuck” factor of the source and finding that difficult to overcome. When given more information on the process, customers expressed concerns about the carbon emissions and energy intensity of the processes involved. Through our ongoing research we explored further customer views, using a real example, where the customers could receive the recycled water. The research told us that when water recycling was explained, the majority of customers were accepting and supportive.

Increasing the size of existing reservoirs was the option that scored second highest. This echoes wider research including that undertaken as part of the SROs where they find reservoirs are the most appealing of the source options, with the perceived benefits outweighing the relatively few concerns.

Finally, recent research carried out after the publication of the dWRMP had very strong feelings from customers and stakeholders alike on the UDVRE and STT SROs. As detailed above, as a result of that feedback, neither of those schemes are present in the preferred plan.

⁸ Water Source Change research for the SROs

⁹ WRMP decision making metrics survey



7.GOVERNANCE

GOVERNANCE AND ASSURANCE

Throughout the development of this WRMP, we have engaged with the Severn Trent Executive Team (STEC), and the Severn Trent Board. We have used this ongoing engagement to agree the strategic decisions set out in our WRMP. Our methodologies and data have passed through a robust multi-stage governance and assurance process.

Assurance

We have used an established three-line assurance model for our regulatory submissions (see Figure 3.7). We target this model using a risk-based approach which considers areas that we know are of prime importance to our customers and regulators, or may have a significant financial value, alongside the likelihood of reporting issues. Areas that are higher risk receive the full three lines of assurance while other areas may be targeted with first or second line only.

Figure 7.1: Our three lines of assurance

Impact	3	M	H	H	Risk	Assurance needed
		L	M	H		
2	1	L	L	M	High	1 st , 2 nd and 3 rd line assurance
	1	2	3		Medium	1 st and 2 nd line technical assurance
Probability						

Technical assurance is first undertaken by an expert in the topic, followed by a second assurance review by an independent internal assurer. Jacobs Consulting (Jacobs) is our established independent external technical assurer, who undertakes third line assurance. The full three levels of assurance have been applied to:

- WRMP24 data tables
- The methodologies applied to create the data tables
- Our approach to customer and stakeholder engagement and its outcomes
- Our approach to environmental destination
- The alignment of our WRMP with PR24 planning and regional planning

Governance

STEC and the Board have been engaged at appropriate milestones and decision points through the development of the plan. Once fully assured, the submissions have then progressed through a comprehensive governance process and been signed off by the following Committees and Boards:

- Disclosure Committee
- Audit & Risk Committee
- Executive Committee and
- Board for final approval to submit.

Table 7.1 summarises the assurance and governance timeline.

Table 7.1: The stages of governance for WRMP24

Milestone	Governance step	Date
Assurance of methodologies and models	Executive Committee Update	December 2021
dWRMP Pre-consultation	Disclosure Committee Update Executive Committee Update	January 2022
Assurance of data inputs, WRMP Tables & Narrative Documents	Disclosure Committee Update Audit & Risk Committee Update Executive Committee Update Board Update	May-Aug 2022
dWRMP Submission	Disclosure Committee Approval Audit & Risk Committee Approval Executive Committee Approval Board Approval	September 2022
Statement of Response publication	Disclosure Committee Approval Executive Committee Approval	July 2023
Revised Draft Plan, appendices and Tables submission	Disclosure Committee Approval Executive Committee Approval	September 2023
Statement of Response 2 publication	Disclosure Committee Approval	March 2024
Revised Draft Plan 2, appendices and Tables submission	Disclosure Committee Approval	March 2024
Final Plan Publication	Disclosure Committee Approval Audit & Risk Committee Approval Executive Committee Approval Board Approval	March 2025 March 2025 March 2025 April 2025

Board Approval

Having reviewed the WRMP, the supporting assurance and having taken Jacobs' conclusions into account, our Board makes the following statement:

- We have met our obligations in developing our plan.
- Our plan reflects the Water Resources West regional plan, which has been developed in accordance with the national framework and relevant guidance and policy and provides a clear justification for any differences.
- The Board is satisfied that management have produced a final WRMP that represents a best value solution for managing and developing water resources in line with our obligations to supply water and protect the environment, that takes into account the interests of customers, local communities and the environment, based on robust evidence and costing processes aligned to the Final Determination.

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WONDERFUL ON TAP

