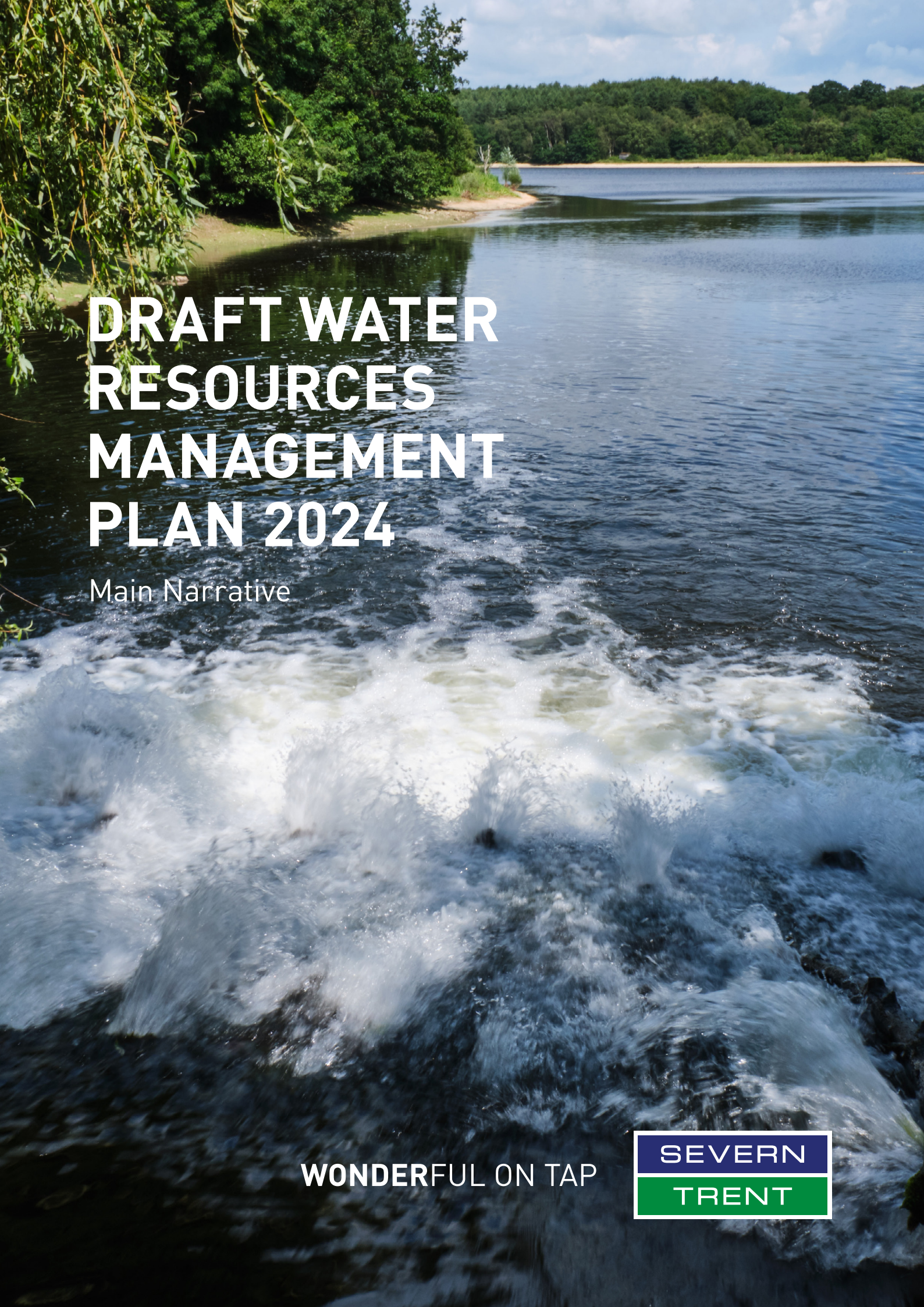


DRAFT WATER RESOURCES MANAGEMENT PLAN 2024

Main Narrative

WONDERFUL ON TAP

SEVERN TRENT

Technical appendices

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 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 DRAFT WRMP

OUR CHALLENGES

Our draft plan describes a likely future supply / demand deficit of 244Ml/d by plan year 2040-2041 growing to 540Ml/d by 2050-2051, 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.
- **Leakage** – currently around 23% of the water we put into supply is lost through leakage. Our leakage reduction activities reduced leakage by 72Ml/d (15%) 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.

WHAT WE PLAN TO DO

Demand

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%	135 million litres	2045
Deliver the Severn Trent Efficiency Plan	37 million litres	2050

Supply

At the same time, we plan to deliver a range of schemes to ensure water supplies can cope with a 1/500yr drought by 2039, whilst keeping pace with climate change and the requirements set out by the Environment Agency by 2050.

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	151 million litres
AMP 9 - between 2030 and 2035	36 million litres
AMP 10 – between 2035 and 2040	25 million litres
AMP 11 – between 2040 and 2045	38 million litres
AMP 12 and beyond – 2045 to 2050 and beyond	490 million litres

*AMP = Asset Management Period

To do all this we need to invest an average of £218 million per year (Total Expenditure) between now and 2050. To reach our long-term targets would mean an annual incremental increase on customer bills of £1.73, so bills would be £43 higher by 2050.

3. ABOUT THIS DRAFT 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 a draft of our fifth WRMP. This draft WRMP (dWRMP) 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.

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 a number of specialist consultants and partners to help us develop the recommendations set out in our dWRMP. Throughout the development of this plan, we have shared our emerging thinking with technical specialists at the Environment Agency, and we have engaged with expert stakeholders to understand their views.

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 draft 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 draft plan describes a likely future supply / demand deficit of 244Ml/d by plan year 2040-2041 growing to 540Ml/d by 2050-2051, inclusive of the benefits of TUBs, Drought Permits and Drought Orders in line with our levels of service. 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 dWRMP24 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 draft plan. Our dWRMP24 explains how we propose to meet the challenges described in the Environment Agency's National Framework.

A summary of the National Framework's expectations for regional planning is shown in Figure 3.1.

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 Plant
- contain all the detailed information required for Drought Plants

One of the most significant challenges we face in this draft 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 dWRMP24, 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.

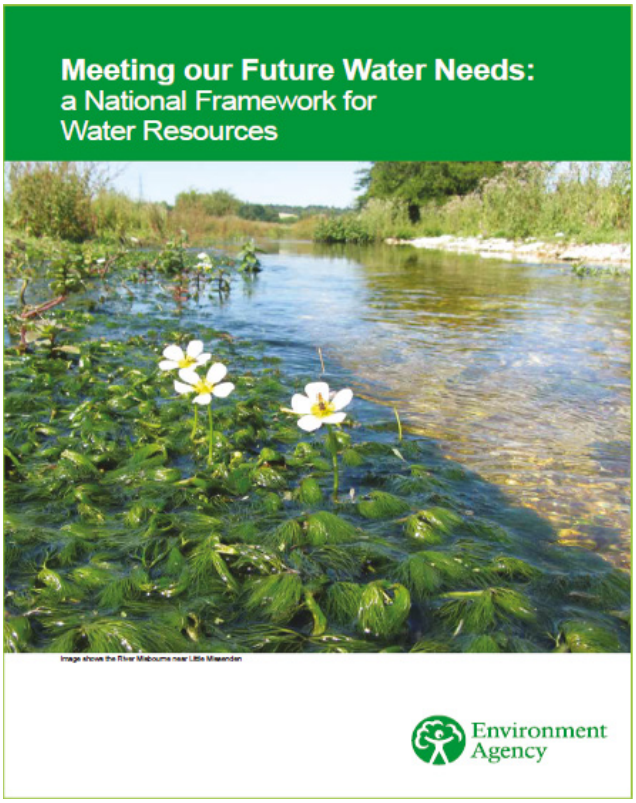
As well as protecting and improving the future water environment, the solutions described in our draft plan will help us to achieve resilience to 1 in 500 year drought events, improve supply resilience to climate change, drive down leakage and help reduce household water consumption to the government's 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 draft plan recommends a number of low / no-regret decisions that we can be confident are needed. Our draft 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 draft 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 – United Utilities, Dŵr Cymru Welsh Water, Hafren Dyfrdwy and South Staffs Water to develop a plan for our region.

Figure 3.2 - The five regional water resources areas



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. Both Company plans and Regional plans will be published at the same time.

There are many interactions between the WRW region and other regions as well as other users of the water environment. Alongside core members, WRW also has associate members who provide input into the development of the plan. These include:

- Canal and River Trust
- Energy UK
- National Farmers Union
- Confederation of Paper Industries
- Wessex Water
- Bristol Water
- Affinity Water
- Thames Water

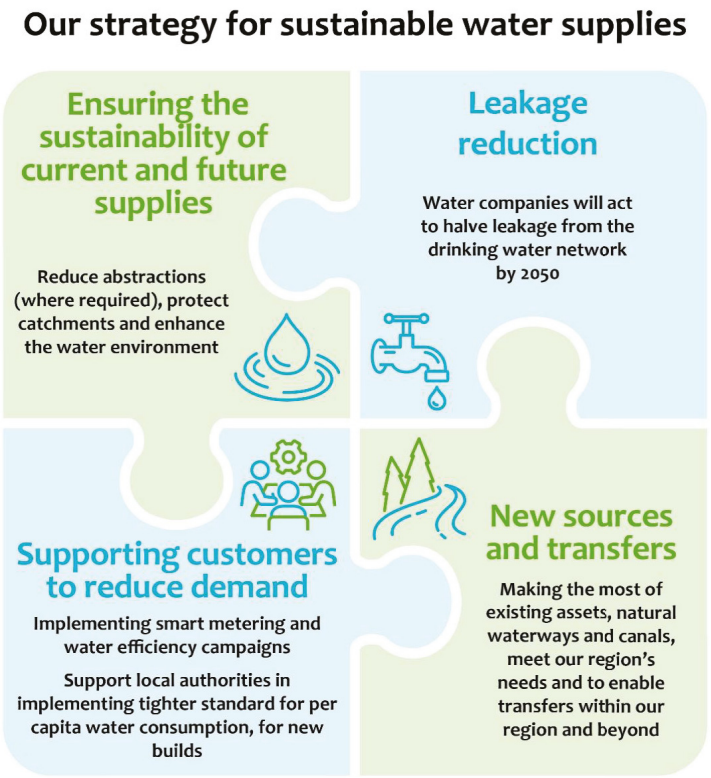
Natural Resources Wales (NRW), Welsh Government, Natural England, the Department for Environment, Food & Rural Affairs (DEFRA), Ofwat and the Regulators Alliance for Progressing Infrastructure Development (RAPID) also provide advisory support to WRW.

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.

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.

The draft regional plan 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



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, Anglian Water), regulators including the Environment Agency (EA), NRW, Ofwat, Natural England, 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

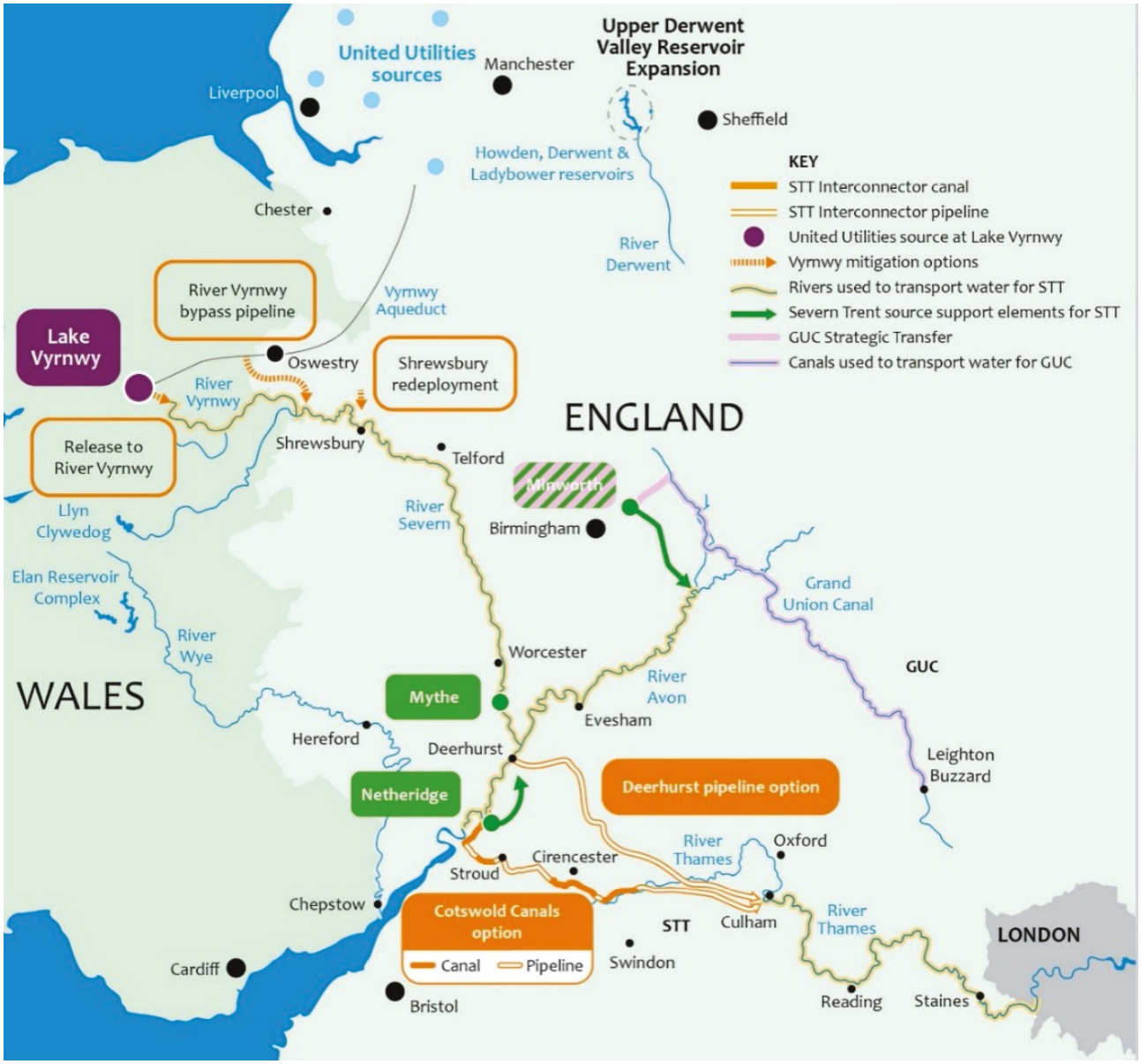
In 2019, Ofwat's final determination of price limits included an allowance for expenditure to progress the development of strategic regional water resource solutions. As a result, a number of projects were initiated to gather evidence on the feasibility of delivering Strategic Resource Options (SROs) that could benefit national and regional long term water security of supply.

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 dWRMP24 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 interact directly with our dWRMP24 are the Grand Union Canal transfer and the elements that make up the Severn to Thames Transfer, both of which would transfer water to Water Resources South East, and the Upper Derwent Valley Reservoir Expansion 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 dWRMP24 are being 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 draft 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 **here.**

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 dWRMP 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 dWRMP 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 commence 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 dWRMP 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 draft Water Resources Management Planning Guidelines. Figure 3.5 illustrates how the stages of our approach correspond to those principles.

Figure 3.5: How our best value decision tools map to Chapters 9 & 10 of the EA's WRMP guidelines

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

AFFORDABILITY

We will need significant investment over the next 25 years and beyond to meet the challenges described in this draft 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 draft plan.

We have assessed the impact on customer bills of the investment needed to deliver the schemes described in this dWRMP24. Our assessment shows that the impact to the average customer's bill would be an annual incremental increase of £1.73, indicating bills would be approximately £43 higher by 2050 (see Table 3.1). This assumes all investment is considered across revenue and Regulated Capital Value (RCV) as in prior plans.

Note that within dWRMP24 data table 8 we include cost information in relation to the Strategic Resource Options (SROs), however the bill impact presented here excludes the SRO costs as these will not be paid for by Severn Trent customers.

Table 3.1: Estimated bill impacts of dWRMP24

Scenario	Benefit (per day)
Average over 25 years (2050)	£1.73 per year (£43 by 2050)

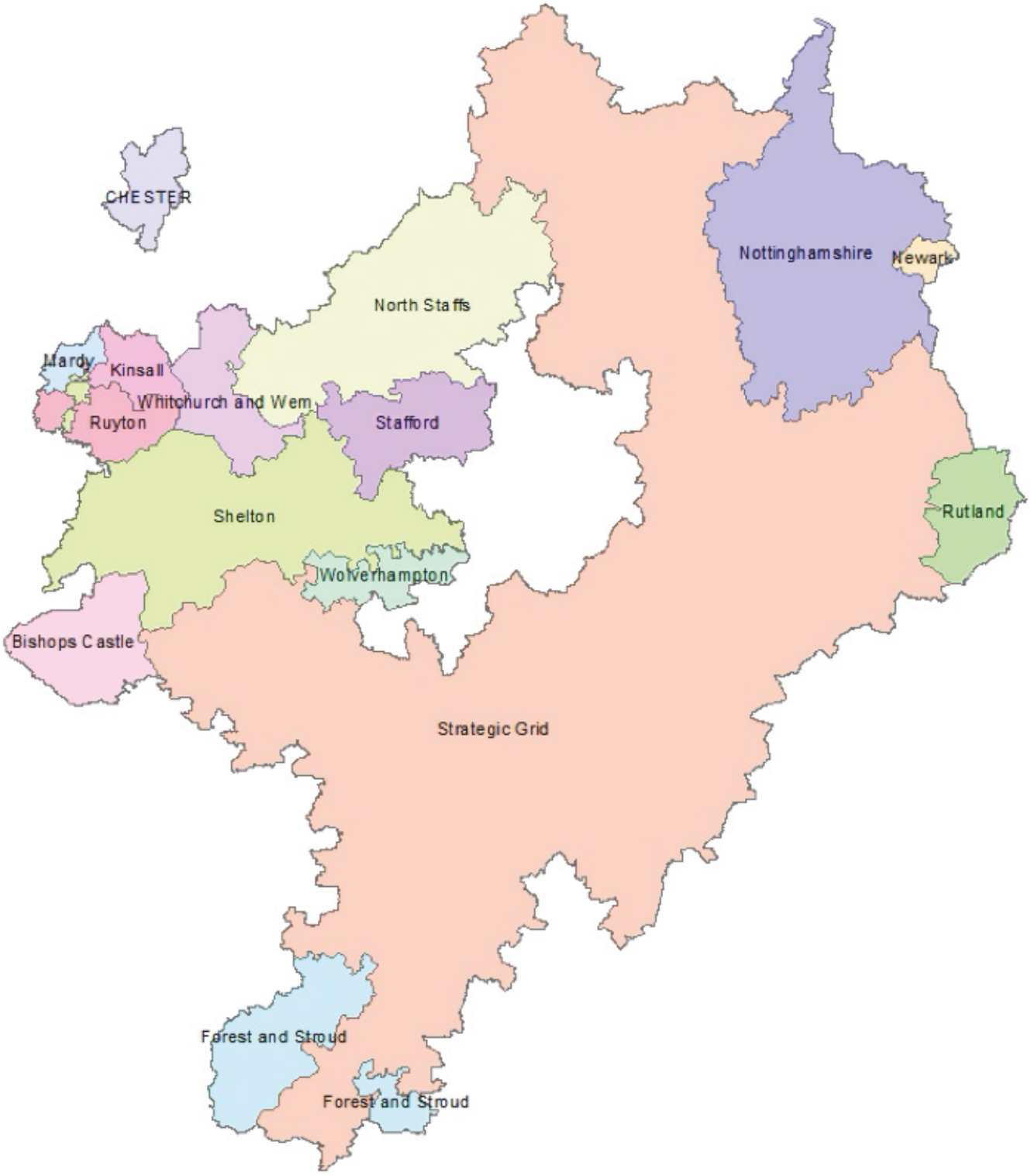
We are still developing our overall business plan (PR24) for the next five year investment cycle. The WRMP forms part of our broader planning. The impacts of investment and future affordability of our WRMP in the context of our broader plans will be considered as part of PR24. A best value plan will be generated as a result of this process.

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 are reviewing our zone boundaries and will report on progress in the final plan.

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 dWRMP.

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. However, household consumption remains high, which is likely to be due to customers adopting hybrid working arrangements, customers continuing to practice health advice and residual behavioural change impacts from changes during the COVID-19 lockdown periods. 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 dWRMP24.

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.

In response to the exceptional hot, dry weather 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 money, water and energy saving advice. The team also provided additional home water efficiency checks, signposting customers to our free products and advising on leaks in the home.
- Our education team contacted all schools in Leicestershire and Derbyshire, 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 demonstrated the flexibility of the supply networks that make up our WRZs.

Green Recovery

Our region's economy was one of the hardest hit 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 delighted 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, which will see us install thousands of sustainable urban drainage schemes including rain gardens, retention ponds and swales, will create a greener, cleaner environment across Mansfield. 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.

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 will be able to 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 93 million litres per day (Ml/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 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 effluent 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 monitor, 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.

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 have to 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 dWRMP24 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 dWRMP24 provide a comprehensive explanation of these methods and how they have been used to inform this draft plan.

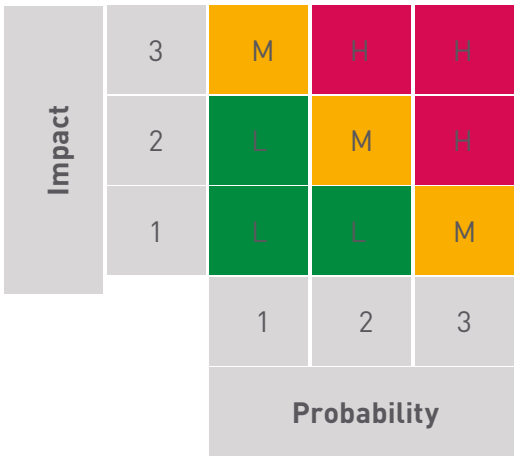
GOVERNANCE AND ASSURANCE

Throughout the development of this dWRMP, 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 dWRMP. 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 3.7: Our three lines of assurance



Risk	Assurance needed
Risk	1st, 2nd & 3rd line assurance
Medium	1st and 2nd line technical assurance
Low	1st line assurance

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:

- dWRMP24 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 dWRMP 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 draft 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 3.2 summarises the assurance and governance timeline.

Table 3.2: The stages of governance for dWRMP24

Milestone	Governance step	Date
Assurance of methodologies and models		December 2021
dWRMP Pre-consultation		January 2022
	Disclosure Committee Update Audit & Risk Committee Update Executive Committee Update Board Update	May 2022
Assurance of data inputs, WRMP Tables & Narrative Documents		May-Aug 2022
dWRMP Submission	Disclosure Committee Approval Audit & Risk Committee Approval Executive Committee Approval Board Approval	September 2022

Board Approval

Having reviewed the dWRMP, 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 are committed to produce 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 PR24 business plan.

Our Board are supportive of the need to produce a best value plan. A key feature of the WRMP is that there are choices about the ambition and pace of delivery. This is why the production of a draft WRMP is critical – it allows us to understand different views so we can ultimately produce the best value plan for our customers and region. Following the publication of our draft plan we will be undertaking extensive engagement and consultation with our customers and stakeholders. This insight will feed into our processes and robust costing models, aligned with our PR24 plan, to produce a best value plan for the final submission. Jacobs, our external auditors, confirm that this approach is reasonable and appropriate.

As such, in this draft submission, we have provided an alternative Board statement (statement 3), which confirms our commitment to produce a best value plan for customers and stakeholders for the final WRMP.

LINKS TO OTHER PLANS

Our dWRMP24 has been developed closely alongside a range of other plans (see table 3.3).

Table 3.3: Alignment with other strategic plans

Plan	How our dWRMP 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 dWRMP 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 5 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 dWRMP contributes to the objectives set out in the Environment Agency's River Basin Management Plan (RBMP).
Drainage & Wastewater Management Plan (DWMP)	In June 22 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 dWRMP have taken these hazards into account and we have included mitigation measures where needed.
Local Authority plans	Our dWRMP 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 which has been published at the same time.
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.

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 draft 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, and we face uncertainty in consumption patterns due to COVID-19; we need to be able to meet that growth in demand for water services against this uncertain future 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.

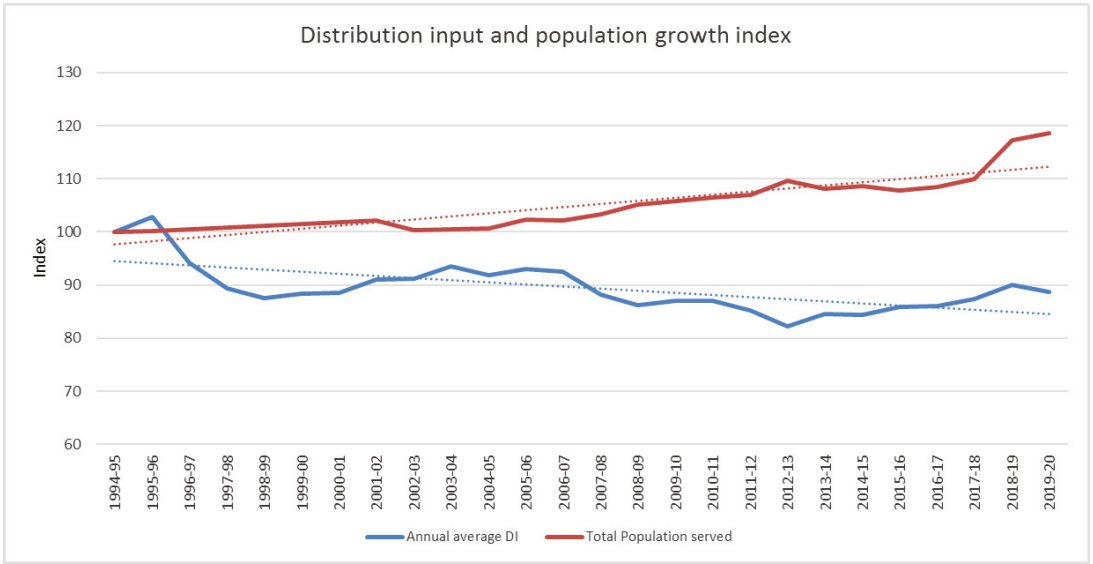
Since the year 2000 the population of our region has grown by 1.2 million people, but over this same period the total amount of water we put into supply has broadly remained flat. We have achieved this in part by reducing leakage on our own network and helping customers to reduce their own water consumption.

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 49Ml/d (10%) between 2010 and 2020, and reduced water consumption by around 45Ml/d through our water efficiency programme.

This dWRMP24 highlights that 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, 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 dWRMP24 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) 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.

Our water demand forecasts make an allowance for the ongoing uncertainty around the long-term effects of COVID-19 on water consumption. In our region, we observed an uplift in household demand because of the COVID-19 pandemic. Household consumption remains high, which is likely to be due to customers adopting hybrid working arrangements, customers continuing to practice health advice and residual behavioural change impacts from changes during the covid lockdown periods. 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.

IMPROVING OUR RESILIENCE AGAINST DROUGHTS

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 dWRMP24 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 dWRMP (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 dWRMP24 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 storage reservoirs hits 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.

Our customer research for this plan has shown that restrictions to supply are not considered particularly impactful measures for consumers, and current levels of service are acceptable to the majority of customers.

This dWRMP24 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 draft River Basin Management Plans.

To achieve these goals we will need 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 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 licencing 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.

We estimate that the impacts of the licence capping policy will reduce our current deployable output (the amount of water available to supply) by 180Ml/d by 2040, whilst the environmental destination impacts will reduce our deployable output by a further 260Ml/d by 2050.

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. As a result, in dWRMP24 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.

There are many sites where we are uncertain about the precise licence changes, and the timing of these changes, that will be needed to prevent WFD deterioration, and so we are carrying out extensive environmental investigations across many surface and groundwater bodies to understand what changes will be needed. These investigations are ongoing, and so for this dWRMP24 we have had to make assumptions about the licensed abstraction changes that we will ultimately need to make to prevent future deterioration. For our preferred plan we have staggered these abstraction licence changes between 2030 and 2040 in the following way:

- for those sources that are at a lower risk of deterioration, we have assumed a loss of 50% of the difference between our current deployable output and recent actual abstractions from 2030,
- the full reduction of average licence to recent actual baseline levels will be in place by 2040.

To manage the ongoing uncertainty around the necessary licence changes we have also explored alternative scenarios to test the impacts of different assumptions. Our adaptive planning has tested the investment impacts of staggering the timing of reducing to the recent actual abstraction baseline between 2030 and 2035 as well as the impacts of making the full reductions in 2030.

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 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 dWRMP24.

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 dWRMP24.

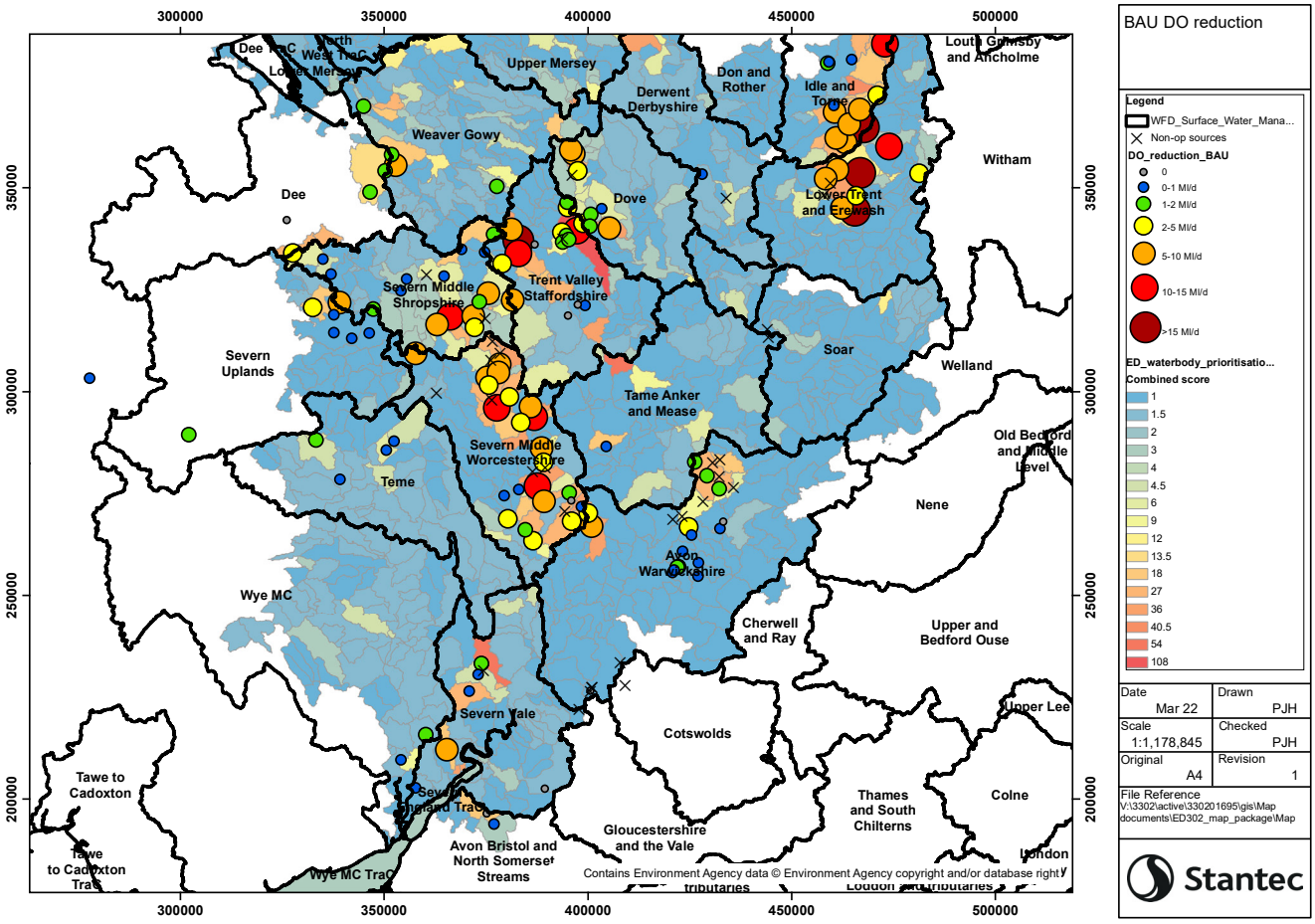
Table 4.1: Total Environmental Destination sustainability reductions by 2050

Enhanced	BAU+ Min to be included in the WRMP baseline tables		Plausible Low
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
471Ml/d	442Ml/d		338Ml/d

These National Framework environmental destination scenarios have a material impact on our long-term supply / demand balance. For dWRMP24 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 dWRMP24, our PR24 business plan will also include 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 dWRMP24 preferred plan.

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

PLANNING FOR CLIMATE CHANGE AND UNCERTAINTY

Our dWRMP24 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 dWRMP24 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 draft 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 of 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 climate change modelling approach is described in detail in Appendix A.

MANAGING UNCERTAINTY AND MAKING COMPLEX DECISIONS

This dWRMP24 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 dWRMP24 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 most likely 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 dWRMP24 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 draft 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 dWRMP24. These are summarised in Table 4.2.

Table 4.2: Our dWRMP24 alternative pathways

Pathway number	Pathway name	Description

0	Core pathway	The core pathway follows Ofwat's PR24 definition and includes all activities that need to be undertaken to be ready for all plausible future scenarios and should include:
		● 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:
		  ● in both benign and adverse scenarios;
		  ● across a wide range of plausible scenarios; or
		  ● need to be undertaken to meet short-term requirements
		The Ofwat core and the most likely WRMP (AP1) are the same for AMP8 and AMP9 due to certainty of SDB deficit in the short-term

AP1	Least cost	The least cost pathway follows the Environment Agency's WRMP planning guidelines and represents the activities that need to be undertaken to address our assessment of the most likely future supply and demand balance while also meeting our legal and regulatory policy requirements but in a least cost way. This This pathway includes activities needed: ● To meet the EA obligations as per the WRMP guidance and other policy/ statutory driven publications ● The supply-demand balance exposed by following all of the regulatory guidance / policy, ● Using 'best central estimates' of data and planning assumptions and assessments of most likely future scenarios. ● Using the best understanding of the EA's BAU+ environmental destination scenario.
AP2	Environmental stretch	This pathway uses the 'enhanced' long term environmental destination scenarios.
AP3	Gated success	This pathway explores the decision points that will arise as the Strategic Resource Option projects progress through Rapid's gated process. In this pathway we may adopt the SRO solutions if they prove to be better value options than those in the most likely pathway.
AP4	Climate adjustment	This pathway includes the decisions that we will need to take under the more extreme climate change impacts that might arise under the RCP8.5 global emissions scenario.

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.

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	3034-35	2039-40	2044-45	2049-50	2054-55	2059-60	2064-65	2069-70	2074-75	2079-80	2084-85
Bishops Castle	1.68	1.66	1.67	1.64	0.40	0.38	-0.59	-0.62	-0.64	-0.68	-0.71	-0.75	-0.77
Chester	1.16	2.10	2.21	1.92	1.72	1.41	0.98	0.51	-0.08	-0.52	-1.03	-1.59	-2.24
Forest and Stroud	2.31	1.80	1.79	-0.62	-0.68	-0.82	-5.81	-6.23	-6.58	-7.01	-7.47	-8.10	-8.36
Kinsall	0.43	0.36	-0.14	-0.20	-0.22	-0.24	-0.28	-0.33	-0.38	-0.45	-0.50	-0.57	-0.61
Mardy	0.20	0.09	-0.63	-0.70	-0.72	-0.73	-3.33	-3.38	-3.42	-3.46	-3.50	-3.54	-3.56
Newark	1.23	2.13	2.10	1.66	1.61	1.55	0.00	-0.16	-0.31	-0.46	-0.64	-0.84	-0.92
North Staffs	14.35	13.98	-8.08	-6.72	-28.14	-28.59	-102.63	-104.20	-105.70	-107.22	-108.68	-110.30	-111.03
Rutland	2.25	1.39	1.04	0.93	0.88	0.82	0.69	0.55	0.41	0.26	0.11	-0.05	-0.21
Ruyton	0.84	0.72	0.70	0.65	-0.28	-0.30	-0.83	-0.89	-0.96	-1.03	-1.08	-1.15	-1.19
Shelton	13.78	11.27	-16.32	-17.89	-36.86	-37.44	-81.29	-83.00	-84.96	-86.96	-88.87	-91.12	-92.90
Staffs	5.03	4.32	3.80	-0.33	-0.58	-0.67	-14.49	-14.75	-15.10	-15.43	-15.86	-16.20	-16.39
Nottinghamshire	1.20	4.06	-46.35	-53.09	-54.32	-55.28	-117.51	-120.05	-123.89	-127.43	-130.71	-133.55	-136.11
Strategic Grid	15.90	-13.13	-61.61	-120.20	-133.54	-152.47	-222.14	-245.65	-274.81	-301.40	-328.08	-354.93	-382.60
Whitchurch and Wem	3.65	3.44	-0.28	-0.33	-0.39	-0.45	-0.91	-0.99	-1.09	-1.25	-1.38	-1.50	-1.61
Wolverhampton	6.32	5.46	3.40	1.55	1.23	1.03	-15.26	-16.04	-16.68	-17.47	-18.51	-19.30	-20.10

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 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 of the other alternative pathway investment scenarios we have included in the dWRMP24.

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 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.

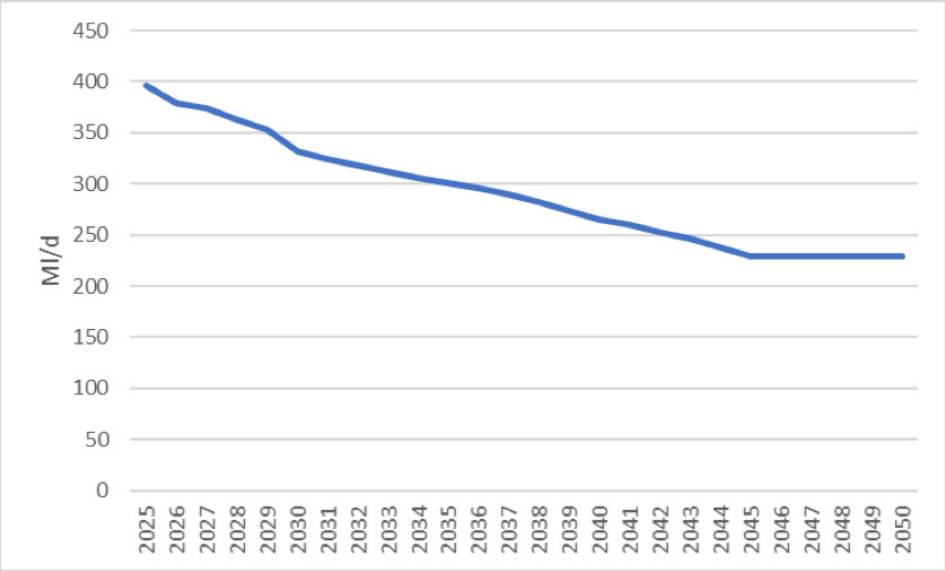
Our preferred plan also indicates some large and challenging supply options that are likely to be required by the 2050s to meet the challenges presented by the EA's environmental destination scenarios as well as the impacts of climate change. The EA's Water Resources Planning Guidelines require us to 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.

LEAKAGE REDUCTION

In WRMP19 we set out our long-term commitment to halve water leakage by 2045, and that commitment continues in this latest dWRMP24. 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.

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 1.1m new smart meters and proactively upgrade 1.4m existing meters by 2035. As part of our overall smart metering strategy, we are also considering the phasing options and associated costs of replacing our existing meter asset base to AMI.

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.
- 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.

- As we roll out our universal metering programme and make increasing use of smart meter technology, we will proactively use leak alarms to identify opportunities to repair supply pipe leaks.
- Incentives to house builders to build new properties to higher water efficiency standards than those required by Building Regulations through our Environmental Discount Scheme. We will also target new build homes to help identify and repair leaking toilets which from previous work we understand may be a significant cause of demand in new build properties.
- 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.

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 with non-household customers to help them reduce water consumption. 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 options.

Our preferred plan includes the demand saving benefits that will accrue from our proactive metering and enhanced water efficiency activities. In the longer term, 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 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 AMP12 onwards.

OUR PREFERRED WATER SUPPLY OPTIONS

Our preferred plan promotes options that make best use of existing sustainable sources of supply. 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 4-8 summarise the preferred new supply options that feature in our dWRMP24 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 draft 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.

Schemes marked with an * in tables 4 to 8 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 4.

Table 4: Best-value supply options in AMP8

Scheme Name	Benefit (per day)
Transfer from Strategic Grid to Notts	37 million litres*
Carsington to Tittesworth transfer	30 million litres*
United Utilities Vyrnwy release to River Severn	25 million litres
Expand Strensham Water Treatment Works	15 million litres
Expand Shelton Water Treatment Works	12 million litres
Expand Draycote Reservoir	9 million litres
Expand Homesford Water Treatment Works	5 million litres
Increase output from Little Eaton Water Treatment Works	5 million litres
Increase output from Whitacre Water Treatment Works	4 million litres
Increase output from Trimpley Water Treatment Works	4 million litres

BETWEEN 2030 AND 2035

The best-value supply options as per our preferred plan for AMP9 are detailed in Table 5.

Table 5: Best-value supply options in AMP9

Scheme Name	Benefit (per day)
End Derwent Valley exports to Yorkshire Water	35 million litres
An internal import to Mardy starts	1 million litres
Exploration of United Utilities import to Shelton	n/a
Exploration of raising levels at Tittesworth	n/a
Exploration of increasing storage at Derwent Valley	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 6.

Table 6: Best-value supply options in AMP10

Scheme Name	Benefit (per day)
United Utilities import to Shelton starts	25 million litres
Start work to raise levels at Tittesworth	n/a
Start work to increase storage at Derwent Valley	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 7.

Table 7: Best-value supply options in AMP11

Scheme Name	Benefit (per day)
New Water Treatment Works near Stafford	23 million litres
Expand Ogston Water Treatment Works	15 million litres
Continue work to raise levels at Tittesworth	n/a
Continue work to increase storage at Derwent Valley	n/a
Start work on new Water Treatment Works at River Weaver	n/a
Start work on new Water Treatment Works in Nottingham on River Trent	n/a
Start work at East Midlands Quarry (site 1)	n/a
Start work at West Midlands Quarry	n/a
Start work on third party reservoir and new treatment works	n/a
Start work on new groundwater source near Soar	n/a

2045 TO 2050 AND BEYOND

The best-value supply options as per our preferred plan for AMP12 and beyond are detailed in Table 8.

Table 8: Best-value supply options in AMP12 and beyond

Scheme Name	Benefit
Complete expansion at Carsington Reservoir	110 million litres
Derwent Valley storage increase	60 million litres
Complete new storage at East Midlands Quarry site 2	45 million litres
Complete new storage at West Midlands Quarry	33 million litres
Complete work on new Water Treatment Works in Nottingham on River Trent	30 million litres
Transfers from Grid to Notts (Ambergate)	30 million litres
Birmingham to Wolverhampton link	32 million litres*
Complete new storage at East Midlands Quarry site 1	24 million litres
Complete work on new Water Treatment Works on River Weaver	20 million litres
Third Party Reservoir and new Treatment works	18 million litres
Carsington to Tittesworth transfer (phase 2)	16 million litres*
Oldbury to Meriden link	15 million litres
Complete Tittesworth Reservoir storage increase	14 million litres
Hampton Loade to Nurton link	12 million litres*
Dam extensions at Whitacre, Stanford and Shustoke	9 million litres
Blackbrook reservoir	8 million litres
Imports from United Utilities to North Staffs	8 million litres
Milton groundwater source	5 million litres
Complete new groundwater source near Soar	5 million litres
Increase output from Draycote Water Treatment Works	4 million litres
Recommission groundwater source at Elmhurst	2 million litres
Increase output from Campion Hills	2 million litres
Ruyton support link main	1 million litres
Import from United Utilities to Kinsall	1 million litres

To do all this we need to invest an average of £218 million per year (Total Expenditure) between now and 2050. To reach our long-term targets would mean an annual incremental increase on customer bills of £1.73, so bills would be £43 higher by 2050.

SUPPORTING THE STRATEGIC RESOURCE OPTIONS

We are a core member of WRW and the activities described in our dWRMP24 will help to deliver the regional planning objectives set out in the EA's National Framework. We have described in the preceding sections of this document how we will face into the significant challenges to our long-term water supply/demand balance due to a variety of pressures. However, despite these pressures we are still able to support the use of inter-regional transfers that would be needed to help supply Water Resources South East.

The WRW draft regional plan explains how the regional planning groups have worked together through several iterations of plan reconciliation to arrive at a recommended set of inter-regional transfers. This inter-regional reconciliation provides important evidence to inform how the strategic resource options (SROs) should proceed. More details about the regional plan and the inter-regional reconciliation process can be found in the WRW draft plan.

Following the second reconciliation between the regions which ended in May 2022, we selected two strategic transfers from WRW to Water Resources South-East (WRSE) into our draft plan. These are the Grand Union Canal (GUC) transfer and the River Severn to River Thames (STT) transfer. We have a role to play in supporting both of these transfers.

The GUC strategic transfer will utilise the existing canal infrastructure to transfer water from the Midlands to areas of planning deficit in Hertfordshire and North West London. The scheme plans to utilise treated discharge from our Minworth wastewater treatment works as the resilient source of water to supply this canal transfer. This transfer has been selected by WRSE to supply 50Ml/d of water into the South East starting in 2031 and raising to 100Ml/d by 2040.

The Severn to Thames Transfer will convey raw water from the River Severn into the River Thames via an interconnector. WRSE has assessed many variants of this and selected the 500Ml/d pipeline option as part of their adaptive plan. The earliest this could come into operation is 2040, however in the reconciliation baseline scenario it is first used to provide a supply demand balance benefit to the South East in 2050. Whilst this transfer can access available water at high flows in the lower Severn, it also has multiple support options that can be called upon to support abstraction from the Severn. The support elements selected by WRSE in the reconciliation baseline scenario involve the use of treated discharges from our Netheridge wastewater treatment works. This support element has been selected by WRSE to supply 35Ml/d into the south east from 2050.

The supply and demand actions described in our dWRMP24 will allow us to facilitate these transfers to WRSE. More details about these projects are available on the Severn Trent website **here.**

The Gate 2 papers, which include details of the latest understanding of these projects and how they are developing are due to be published to the website in November 22

In addition, our dWRMP24 includes the use of the North West transfer SRO to transfer water from United Utilities to Severn Trent. The North West transfer is one of the support elements of the wider Severn to Thames transfer. Our preferred plan includes the use of 25Ml/d of this transfer as part of our no/low regrets pathway and we have also included the full 75Ml/d transfer in our Gated Success adaptive pathway. The use of this transfer is part of a joined-up, national adaptive plan, in which we could use up to 75Ml/d of the North West Transfer SRO water in a low regrets way until it is needed by the South East in the very long term. These options were selected for the Severn Trent plan on the basis that they had not been selected by the South East at present. We can develop other sources to be ready whenever the need in the South East arises. At that point this element of the North West transfer can switch over to WRSE, via the Severn to Thames Transfer.

PROTECTING THE WATER ENVIRONMENT

The measures set out in our dWRMP24 will protect and improve the water environment. This draft 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 23.5Ml/d and to forgo up to 88Ml/d of spare licence capacity in the surrounding aquifer.

The long-term environmental destination delivered by our dWRMP24 goes way beyond the commitments described in WRMP19. This draft 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 potentially 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 draft plan will provide alternative ways of meeting customers' demand for water.

Overall our dWRMP24 includes abstraction licence and abstraction changes that will result in the deployable output reductions summarised in Table 5.2. 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 5.2: Summary of water resource zone deployable output reductions (Ml/d) in draft WRMP24

Resource Zone	Early regulatory needs, 2030 to 2040			2050 BAU+
	2030	2035	2040	2050
Bishops Castle	0.00	0.00	1.22	2.16
Chester	0.00	0.08	0.08	0.08
Forest and Stroud	0.36	0.36	0.25	4.96
Kinsall	0.49	0.49	0.49	0.49
Mardy	0.74	0.74	0.74	3.31
North Staffordshire	22.58	22.58	43.91	116.77
Ruyton	0.00	0.00	0.78	1.27
Shelton	27.00	27.00	45.00	87.22
Stafford	0.00	3.45	3.45	16.96
Strategic Grid	34.66	34.66	31.70	79.93
Whitchurch & Wem	3.73	3.73	3.73	4.09
Wolverhampton	1.93	1.93	3.58	19.32
Newark	0.00	0.00	0.00	1.44
Nottinghamshire	48.59	48.59	44.45	104.03
Rutland	0.00	0.00	0.00	0.00
Total	140.08	143.61	179.37	442.02

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
- hydroecology 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 hydroecology 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 we will work with stakeholders to bring environmental improvements and ecological resilience in two priority catchments. During 2021 we have 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 have then shortlisted these down to four preferred catchment enhancement options (see Table 5.3) and we propose we will include these as Environmental Destination schemes in our PR24 business plan WINEP.

Table 5.3: 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, hydromorphology. 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 Wildside 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 hydromorphology. Improved ecological resilience. Flood alleviation. Wetland creation – biodiversity, Water vole habitat. May include alternative approaches to improving flow regime or enhanced recharge that may by traded off against future abstraction reductions.	None known

As well as focussing on these two priority catchments we are scoping out a large-scale investigation programme to evaluate catchment specific opportunities and stakeholder engagement to build catchment improvement plans. We will work with the EA and NRW to agree how these can be included in PR24 WINEP for 2025-2030.

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. These are currently under development with our regulators.

There are also non-public water supply abstractions in these catchments and WRW has undertaken 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 undertaken 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 dWRMP24 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
- River Sherbourne
- Aldford Brook
- Vicar Water
- Rainworth Water
- Bevercotes Beck
- Strine
- Lower Worfe
- Henmore Brook
- Doverbeck
- 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 2,047 grants, totalling over £9m of environmental work being undertaken on farms. This has resulted in reductions of 46,601kg of nitrate; 468kg of pesticides; 1,456kg of phosphate and 1,500ha'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 eleven 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 held eleven events and will be running another series of events later this year and giving 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 DRAFT 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 dWRMP24 is founded on a rich programme of customer insight representing over 10,000 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. 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.

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 aren't starting from scratch, we are building on an extensive programme of research over the last five years, both for the price review but also our significant programme of continual research.

There are five key elements to our dWRMP24 insight strategy, as outlined in Figure 6.1

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

Our programme of work to inform the dWRMP 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 dWRMP24.

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 WRMP 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 and NEUBs 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 of 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 resources plans.
Overall, our customers have been supportive of compulsory metering, driven by the need to solve the future deficit and protect the environments. They recognise the additional benefits which would come from AMI metering. 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 schemes such as 'The Big Difference' implemented in 2020-2025.
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.
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.	We have lobbied hard through both WaterUK 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.
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

STAKEHOLDER ENGAGEMENT

We have held direct stakeholder discussions and consultation activities to inform our dWRMP24. 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're also undertaking 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

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 undertook 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 draft 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.

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.

Our stakeholder engagement activities will carry on as we continue to develop our plan through to submission of the final plan. Our customer and stakeholder engagement has been undertaken 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.

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 our 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 section 4
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 AMP 6 and 7, 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 also provided in section 5
Severn Trent should focus on challenging leakage reduction and demand management activities	In AMP8 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 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
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
ST must seek to understand our customers' views on key topics and ensure these are incorporated into our approach	We have continued to develop the maturity of our customer engagement, using learning from previous WRMPs, and also building on expectations set by CCW, regulators and other stakeholders. This is detailed further in the next section
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 members companies
Backing for sharing water resources outside of the ST region	Our dWRMP 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 section 4

HOW CUSTOMERS AND STAKEHOLDERS HAVE INFLUENCED OUR DRAFT 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 Wales[1] 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 are writing this plan, across the country we have experienced an extended hot, dry weather period. Although we haven't imposed a TUB, many customers are seeing the reality of this playing out in the media in other areas. This will only have been theoretical for some participants in our research who haven't previously experienced a TUB. In our next piece of research, we will explore if perceptions have changed following summer 2022.

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 Wales[2] 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.

As discussed above with regard to TUBs, this position which our customers considered to be unlikely to occur has now been realised in many areas of the country, which may result in changing perceptions.

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.

The environment

We know from our research that protecting and improving the environment is extremely important to both stakeholders and customers. In our deliberative research[3] 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"[4]. In our discussions on Tap Chat, we find that customers want us to both minimise the damage we do and also have a positive impact on the environment.

[1] Understanding customer preferences for Performance Commitments at PR24
[2] Understanding customers' preferences for Performance Commitments at PR24
[3] Strategic Priorities research
[4] WRMP decision making metrics research

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

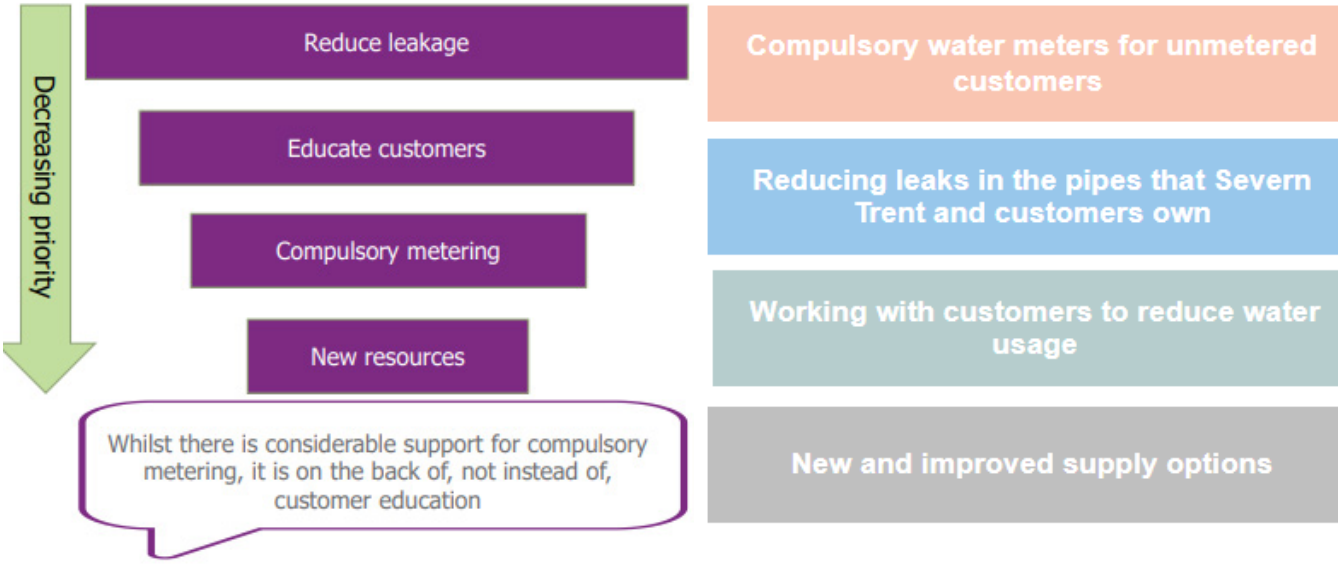
Learning about the supply demand deficit prompts a mix of reactions from customers, ranging from worried and surprised to disbelief. Across multiple studies we have sought to understand customer preferences for the balance of solutions to address the deficit. Customers believe that water companies should 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 schemes[5]. This is also consistent with the findings at the WRW level. See figure 6.3.

- 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.
- 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

[5] WRMP options research, Water Source Changes for the SROS, Environmental destination deep dive

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 them[6].
In our quantitative research[7] 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 / reuse 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. We will explore customer views on effluent reuse further as we consult on our draft WRMP with customers.

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.

[6] Water Source Change research for the SROs
[7] WRMP decision making metrics survey

7. CONSULTING WITH YOU TO UNDERSTAND YOUR VIEWS

We would like to understand your views on the proposals we have set out in this draft plan, and would welcome your responses to the following questions regarding our dWRMP24:

1. Do you support the draft plan we have proposed?
2. Do you agree that our dWRMP represents a fair interpretation of the guidelines as set out by Defra in the Water Resources Planning Guidelines and associated supporting guidance?
3. Do you agree with our strategic priorities and pace?
4. Do you agree that the planning scenarios used represent a fair assessment of the likely future?
5. Do you agree that our ambition to reduce leakage by 50% by 2045, to improve our resilience to drought to a 1 in 500-year resilience after 2039 and to make a step change towards protecting the future water environment represents fair value for money for our customers, with an annual incremental increase on customer bills of £1.73, meaning bills would be £43 higher by 2050?
6. Our draft evaluation of a best value plan delivers a 50% leakage reduction by 2045, with initial 16% leakage reduction between 2025-2030, and 9-13% in subsequent five year planning periods. Do you support this phasing?
7. Do you agree that we should place a greater emphasis on nature-based solutions and the use of partnership activities to solve future challenges over more traditional increases in asset capacity?
8. Do you agree with our approach to protecting the environment across our area, and in the places where we draw water?
9. How would you prefer us to engage with you in the future?

Please send your response before **22nd February 2023** by emailing: **water.resources@defra.gov.uk**, copying in future.**consultation@severntrent.co.uk**, including the following in the subject box: **Severn Trent Water dWRMP Consultation Response.** If you wish to provide feedback by post, the address is:

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