Building a climate resilient future

Our Climate Change Adaptation Report 2024

Contents

Introduction from Chris Weston

> It is fundamental that we understand and plan for the impacts of climate change so that we can continue to serve our customers and protect the environment.

We produce and deliver 2.5 billion litres of safe, clean, wholesome, drinking water to over 10 million customers and treat 5.1 billion litres of wastewater for nearly 16 million customers on demand every single day.

Climate change is one of the biggest challenges our business is facing. Our goal is to maintain customer water and wastewater service and that our plans proportionately accommodate current and future risks such as climate change.

Since the last report in 2021, we have seen the hottest temperature measured in the UK of 40.3°C, the two warmest years on record, the driest July since 1884 and the wettest 18-month period on record in England. All these weather events provided challenges for our business.

We are working to transform our business to address our shortcomings, the increasing expectations from our customers, and long-term challenges such as climate change and population growth. Our plan continues the task of addressing the historically under-funded investment in our ageing network. It will improve our readiness to meet the twin challenges of climate change and population growth, while protecting the environment and continuing to deliver for our customers.

We have assessed climate related risks and opportunities, and their impact on our future plans for delivering water and wastewater services. I am pleased that our Water Resource Management Plan (WRMP) has now been approved by Government. Our WRMP together with our Drainage and Wastewater Management Plan (DWMP) cover medium-term and long-term planning assessments risk and responses. These plans directly feed into our 2024 Price Review financial plan which is submitted to our economic regulator who sets how much we can charge our customers. Ofwat is now considering it and is expected to make a final determination in December 2024.

Whilst climate change is explicitly considered in these plans, it is not considered in isolation from the other significant risks that impact on our business including population growth, environmental regulation, financeability and affordability to customers.

You can find out more on what we're doing to tackle climate change and how we're responding to the threat of increasingly turbulent weather patterns throughout this report.

Chris Weston
Chief Executive Officer

Find out more about Thames Water

About Thames Water

We serve customers in an area that follows the River Thames and stretches from Gloucestershire to Essex, covering countryside, villages, towns and our capital city.

Every day, we deliver over 2.5 billion litres of safe, clean, wholesome, drinking water to over 10 million customers and treat over 5 billion litres of wastewater for nearly 16 million customers on demand, every single day. We couldn't do any of this without the planet's natural water cycle.

Providing safe, clean, wholesome drinking water to the communities we serve, while taking away waste responsibly and protecting this precious resource and the environment for the future drives everything we do. Climate change will make this more challenging, so it is fundamental that we understand and plan for the impacts of climate change so that we can continue to serve our customers and protect the environment.

We have almost
8,000
employees

We serve
10 million
water customers

16 million
wastewater customers

We supply
2.5 billion
litres of water every day

We treat
5.1 billion
litres of wastewater every day

Our operational area map

We have
88
water treatment works

352
sewage treatment works

32,000 km
of water mains

109,000 km
of sewers

We generate
531 GWh
of renewable energy a year

Our Purpose

To deliver life's essential service so our customers, communities and the environment can thrive.

Our values and behaviours

Management focus

Our plans to 2030

A window on the weather

The Met Office State of the UK Climate 2023 report is very clear that the UK's climate is changing, and recent decades have been warmer and wetter than the 20th Century.

Observation has shown extreme temperatures in the UK have been affected much more than average temperature. Six of the last ten years are in the top-ten warmest in the series.

2022 and 2023 were the warmest on record for the UK since 1884 with 2023 being made more likely because of climate change.

The number of 'hot' days (28°C) has more than doubled and 'very hot' days (30°C) more than trebled for the most recent decade (2014-2023) compared to 1961-1990.

It's not just been hot; it has also been wet. Five of the ten wettest years for the UK have occurred in the 21st Century. 2023 was not only hot it was the seventh wettest year on record for the UK in the series from 1836.

The turbulent weather patterns we have experienced over recent years have included many record breaking extreme events that have affected the South East of England. The extreme weather event have tested the resilience of our services, and this combined with historically under-funded investment in our ageing networks creates operational challenges.

Despite this, whatever the weather, we need to be able to deliver the water and wastewater services our customers expect. This is why we have explicitly included climate change impacts in our future planning.

2010	April: Start of two-year drought across England and Wales. November to December: Severe winter weather with very low temperatures and significant snowfalls.
2011	April: Unusually warm spring and persistent lack of rainfall.
2012	March: End equal driest two-year period since 1910 across Southern England. April to July: Wettest spring/summer since 1766 across England and Wales.
2013	March to April: Severe winter weather with very low temperatures and significant snowfalls. July 3rd to 22nd: Long heatwave with maximum temperature of 33.5°C in South East England.
2014	January to February: 12 major storms in sequence cause widespread damage.
2015	July: One-day heatwave with high temperatures reaching 36.7°C at Heathrow in South East England.
2016	September: Heatwave, torrential downpours, and flash flooding in South East England. Temperature of 34.4°C recorded at Gravesend.
2017	June: Temperatures exceed 28°C across parts of England reaching 34.5°C at Heathrow in South East England.
2018	February to March: Very severe winter weather with very low temperatures and significant snowfalls (Beast from the East).
2019	July: Second Hottest temperature on record reaching 38.7°C in Cambridge.
2020	February: Wettest since 1862. August: Heatwave in South East England. October: Storm Alex brings wettest day since 1891.
2021	January to December: Five named storms recorded.
2022	July: Hottest UK temperature on record reaching 40.3°C in Coningsby, Lincolnshire. January to August: Driest across England and Wales since 1976. Hottest year on record for UK since 1884.
2023	January to December: Eleven named storms recorded. March: Wettest since 1981. July: Driest on record since 1884. February, May, June and September 2023 were all ranked in the top-ten warmest months for the UK in the monthly series from 1884. 2023 was the second hottest year on record for UK since 1884. March, July, October and December 2023 were all top-ten wettest months in the UK.
2024	January: Warmest January temperature on record of 19.9°C January to November: Seven named storms. January: Wettest September for Southern England since 1918.

UN Sustainability Goals

The United Nations Sustainable Development Goals (SDGs) are a call to action to end poverty and inequality, protect the planet, and ensure that all people enjoy health, justice and prosperity. They have been developed to make the world more sustainable by 2030.

The 17 SDGs help describe a road map to a more sustainable future but can only be achieved if governments, businesses, civil society and citizens work together.

Supporting the SDGs is part of what we do every day as we deliver life's essential service, so our customers, communities and the environment can thrive.

We fully support the aspiration of all 17 goals, but there are six specific goals, including climate action, where we believe we can make a real contribution.

- **Clean water and Sanitation**
- **Affordable and Clean Energy**
- **Reduced Inequalities**
- **Responsible consumption and production**
- **Climate Action**
- **Life on Land**

In the infographic to the right, we have linked these six SDGs that we are actively contributing towards, including '13 – Climate Action', to the water cycle which describes our interaction with customers and the environment.

Abstract from rivers and aquifers

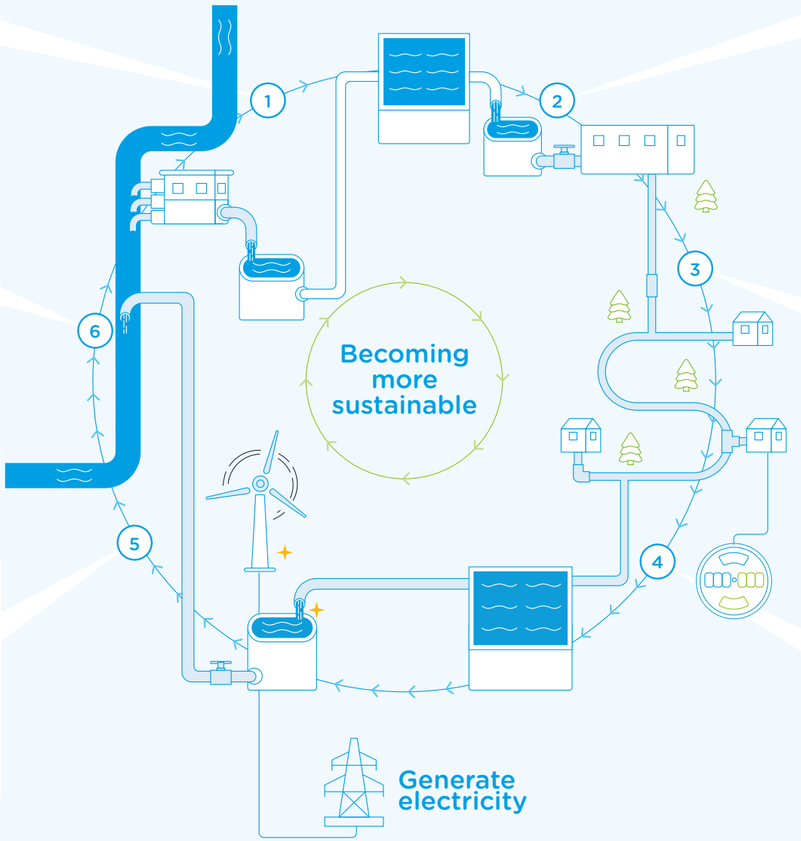
- Protecting chalk streams
- Creating partnerships and wetlands
- Improving biodiversity
- Managing invasive species

Safe return of clean water to the environment

- Treated sewage sludge used beneficially
- River Health Plan updated
- 100 % of agreed coverage of Event Duration Monitors
- Pollution Incident Reduction Plan updated

Treat wastewater at our sewage treatment works

- Commissioned new Mogden Gas-to-Grid plant
- Generated 27.3 % of our energy needs renewably
- Treated 5.1 billion litres of wastewater each day



Clean water at our water treatment works

- Producing over 2.5 billion litres of clean safe drinking water daily
- Secured Government approval of our 50-year Water Resource Management Plan
- Working with Water Resources in the South East on Strategic Resource Options
- Supporting Water Aid

Deliver water to customers' homes and businesses via our network of pipes

- Provide safe and wholesome drinking water to over 10 million customers daily
- Installed over 1 million smart meters to give customers more control over water use
- Financially supported over 358,000 customers via social tariffs

Remove wastewater from customers' homes and businesses

- Safely treating the sewage of nearly 16 million customers daily
- Published our 25 year Drainage and Wastewater Management Plan

Planning for the future

The turbulent weather patterns we've experienced over recent years have tested the resilience of our services. It's one of our biggest challenges – but how we respond offers a great opportunity to do things differently.

In its simplest terms the potential impact of climate change on our business can be described as: too much (e.g. flood), too little (e.g. drought) or the wrong kind of water (e.g. sewer flooding).

Although the timing and extent of climate change remains uncertain, our approach to tackling it is clear. We're adapting our business to meet the challenges and play our part in mitigating them. This approach is a cornerstone of our commitment to becoming more sustainable.

We have set ourselves a tough challenge. Our ambition is a world where we've learnt from the past and adapted to the future to improve our service for our customers and the world around us.

The plans we have developed and published take at least a 25-year forward look for both water resource management and drainage and wastewater management, that explicitly take climate change and its uncertainty into account.

Importantly our plans are not developed in isolation. Since ARP3, we have developed our AMP8 plan for the period 2025-30 through extensive engagement with our customers, communities, our Customer Challenge Group (CCG) and our supply chain, supported by the active involvement of our Executive and Board. Our customer engagement included representatives of all users of our water and wastewater services.

We have an ongoing programme of engagement and interact with over 200,000 customers each year. In addition, we engaged directly with almost 20,000 customers in as part of our 2024 Price Review.

Our **PR24 plan** which reflects the need to adapt to the future impacts of climate change has been submitted to Ofwat. Our plan is now being considered by Ofwat and we expect to receive its final determination on funding in December 2024.

In addition to planning for the unavoidable impacts of climate change we are in parallel working to **mitigate our carbon emissions** both for operational and capital emissions. Carbon mitigation is not covered in this document, but updates can be found in our **Annual Report and Accounts**.

ARP4

In this, our fourth Adaptation Reporting Power report, we:

- Describe our business, the challenges we are facing, how we're responding to them and embedding responses in our plans
- Provide an update on our progress towards becoming a climate resilient business
- Provide case study examples of actions we are taking

> We have seen the two warmest years on record and the highest temperature ever measured in the UK of 40.3°C since our last reports in 2021.

Reporting on climate change

Reporting on climate change isn't limited just to the Adaptation Reporting Power.
We regularly report and update on our approach to climate change through different channels including:

Every year we produce our Sustainability Report and ESG Statement, which includes information about adapting and mitigating climate change. Additional information is also published on our website.

Sustainability Report and ESG Statement

Via strategic plans - Our Water Resources Management Plan (WRMP) and Drainage and Wastewater Management Plan (DWMP) feed into and inform our five yearly financial plan called the Price Review. The WRMP and DWMP explicitly consider climate change challenges, risk, mitigation, and adaptation in their development. They describe how we will continue to deliver our essential services over the long-term (at least 25 years), in the face of challenges and risks such as climate change and population growth.

Water Resources Management Plan

Drainage and Wastewater Management Plan

As part of our Annual Report and Accounts we make a Taskforce on Climate-Related Financial Disclosure (TCFD). In it we outline our progress against each of the four pillars of TCFD – Governance, Strategy, Risks and Metrics and Targets. Our disclosure will continue to evolve our approach in the coming years, as we address customer needs and align with the evolving regulatory and statutory reporting requirements.

Annual Report and Accounts

In response to the Adaptation Reporting Power process in the Climate Change Act 2008, we are again voluntarily reporting on the activities that help us manage the current and future risks of climate change on our ability to deliver water and wastewater service to customers, to the Secretary of State for Environment, Food and Rural Affairs. Our 2021 ARP3 response can be found here.

2021 ARP3 response

Climate change and long-term planning

Our plans

Climate change and long-term planning

Our planning reflects the long-term challenges that puts significant pressure on maintaining existing service levels, and increases the need for investment to repair, replace and enhance our infrastructure.

Importantly it tackles the need to invest in the asset health gap resulting from past AMP decisions. The potential implications of climate change on our activities have explicitly been reflected in the development of several key long-term company plans so that we can continue to deliver water and wastewater services to our customers are described below:

- Water Resource Management Plan 2025-2050
- Drainage and Wastewater Management Plan 2025-2050
- Draft Price Review Business Plan 2025-2030

Water Resource Management Plan

Water companies are required to produce a Water Resources Management Plan (WRMP) every five years which sets out how they will provide a secure and sustainable supply of water to their customers, whilst protecting the environment. The impact of climate change on water resources and drought risk is very complex and highly uncertain. We have undertaken extensive modelling to understand and assess the impact of climate change on our supply capability under different future climate scenarios.

Our latest WRMP used the UKCP18 climate change scenarios which provide the most up to date, comprehensive set of climate change projections available for the UK. We have reflected the RCP8.5 probabilistic projections which are considered by Ofwat to be a 'high' or severe future, and RCP2.6 probabilistic projections to be considered a 'low' or benign future.

UKCP18 emissions scenarios are classified based on changes to radiative forcing rather than socio-economic assessment. These projections are named RCP2.6, RCP4.5, RCP6.0, and RCP8.5, where the value following 'RCP' is the radiative forcing in 2100. More detail can be found in **Appendix U** of our WRMP.

The RCPs can be represented by the levels of temperature change compared to the preindustrial period that result from each scenario. RCP2.6 represents a pathway where greenhouse gas emissions are strongly reduced, resulting in an estimated global average temperature rise of 1.6°C by 2100. With RCP8.5 greenhouse gas emissions continue to increase unmitigated leading to an estimated global average temperature rise of 4.3°C by 2100. More information about RCPs can be found in the Met Office's **UKCP18 Guidance: Representative Concentration Pathways**.

We have taken an 'Adaptive Planning' approach in our WRMP. This adaptive approach means that we will not have a single 'Plan' for the next 50+ years, because the level of uncertainty present over that period would make a single, fixed plan highly inefficient and/or unsuitable. Instead, we have set out investment to solve short-term supply-demand balance risks, and then will have longer term alternative pathways which will set out what investment would be most efficient under different future scenarios.

Drainage and Wastewater Management Plan

In a similar way to how we have developed our long-term WRMP we have produced a Drainage and Wastewater Management Plan (DWMP) based on the national DWMP Framework. The DWMP is a long-term costed plan that is focused on partnership working, which sets out the future risks and pressures for our drainage and wastewater systems. This long-term, collaborative plan aims to provide a resilient and sustainable wastewater service for the next 25 years and beyond. It identifies the actions that are required to make sure we can continue to deliver our services reliably and sustainably, whilst also achieving positive outcomes for our customers, communities, and environment. Where significant uncertainties are identified in developing the plan, we have used an adaptive pathways approach in developing their preferred plan.

The plan has been developed to mitigate the projected impacts of climate change and population growth. Adaptive planning including climate change is integral to our approach to developing our DWMP. More detailed information can be found in **Appendix G** of our DWMP. As with the WRMP we have looked at adaptive pathways planning in the context of RCP2.6 and RCP8.5.

Ofwat

As part of each price control settlement we produce a five year business plan. The plan is reviewed it in the context of RCP2.6 and 8.5. Ofwat's guidance on long-term delivery strategies sets out guidance that within our adaptive planning we should consider a 'low' future scenario based on the 50th percentile of RCP2.6 probabilistic projections, and a 'high' future scenario, based on the 50th percentile of RCP8.5 probabilistic projections.

For the PR24 price control period **Our Long-Term Delivery Strategy** (LTDS) sets out the long-term outcomes that our company aims to deliver. This draws on a series of long-term plans that the company has already developed. Our LTDS complies with the requirement set by Ofwat for water companies to set out their five-year business plans in the context of a long-term delivery strategy, that is tested against specific external scenarios.

The LTDS includes several leading and lagging monitoring metrics related to climate change. We have presented our LTDS through six key chapters that set out the context for change and our vision for 2050, our detailed plan of action for delivering that vision through three key pillars, and how we will make sure our plans are delivered for customers.

We will report annually as part of the Annual Performance Reports as to whether there have been any material changes in the LTDS monitoring metrics. This will give a high degree of transparency to customers and stakeholders.

Scenarios and adaptation

Climate change and long-term planning

We first used climate change data in 1999 to inform WRMP99. During the development of our current plans, we have used UKCP18 probabilistic climate change projections and climate scenario analysis to understand the different pressures climate change creates – like water resource availability, water demand and flooding potential – so that we make appropriate strategic and investment decisions to meet the challenges of an uncertain climate future.

This includes managing our resources more effectively and improving the resilience of our infrastructure.

While climate change impacts are intensifying and increasing global focus, there's still a lot of uncertainty associated with the timing and scale. To help us manage this uncertainty we are using an 'adaptive pathways approach', which is a way of making decisions when the future is uncertain. As we get better information either about climate change itself or its impact on our activities, our responses to different types of risk can be changed or accelerated if the effects are greater or the pace of climate change is faster than we'd projected.

Using scenarios

As part of our five-yearly regulatory planning cycle we already consider and manage a range of climate related risks and opportunities. Since the publication of our ARP3 report our use of climate scenarios has continued to develop. We're now using our own UK Climate Projections 2018 (UKCP18) modelling to increase our understanding of how climate will impact our business.

There is a large degree of uncertainty in the long-term modelling that we do. This is because of the outcomes from different emissions scenarios and the complexity of climate modelling. Scenario planning helps us to frame our options for strategic infrastructure investment and climate adaptation activities so we can adapt depending on which future pathway emerges.

We have undertaken a significant amount of modelling to assess the impact of future climate scenarios, looking at key climate related risks. This has helped inform and shape our strategic plans. These relate primarily, but not exclusively to water resource availability, water demand and wastewater management. A detailed description of these key risks, the regions that may be impacted, and the strategies in place to manage them are outlined in our latest WRMP (covering the period 2025-2075) and DWMP (covering the period 2025-2050). See p12-16 and **Appendix A** for risk and p17-25 for strategic plans.

Representative Concentration Pathways

To model and project future climate, it is necessary to make assumptions about the economic, social, and physical changes to our environment that will influence climate change.

Representative Concentration Pathways (RCPs) are a method for capturing those assumptions within a set of scenarios. The conditions of each scenario are used in the process of modelling possible future climate evolution.

The RCP pathways represent a broad range of climate outcomes but are neither forecasts nor policy recommendations. They include a wide range of assumptions regarding population growth, economic development, technological innovation, and attitudes to social and environmental sustainability. Each pathway can be met by a combination of different socioeconomic assumptions.

RCP2.6 – represents a pathway where if greenhouse gas emissions are strongly reduced resulting in an estimated global average temperature rise of 1.6°C by 2100 compared to the preindustrial period.

RCP8.5 – represents a pathway where if greenhouse gas emissions continue to grow unmitigated, leading to an estimated global average temperature rise of 4.3°C by 2100 compared to the preindustrial period.

The spread of future temperatures covered by the RCPs are broadly captured by our previous analysis of a 2°C and 4°C world. We discussed this in our last update to the UK Government in our adaptation report 'Protecting our Water and World'.

Protecting our Water and World

Managing climate risk

Risk assessment

We completed a climate change risk assessment as part of our ARP3 update to Defra at the end of 2021. The ARP3 risk assessment is still considered to be valid and up to date. Importantly the risk assessment has been used to inform our major strategic plans: the Water Resource Management Plan, the Drainage and Wastewater Management Plan and the Periodic Review 24.

We have refreshed the risk assessment included in ARP3 to reflect progress during AMP7 and Climate Change Risk Assessment 3 (CCRA3) see **Appendix A**.

Every five years, we go through a process called the price review. During this process, we formulate our plans for the next five years. Our AMP8 plans have been developed through extensive engagement with our customers, our communities, our Customer Challenge Group, our supply chain and the active involvement of our Board.

Our PR24 plan for the period 2025-30 which reflects what our customers want and our long-term strategic water and wastewater plans. The outcome of this process is a limit set by Ofwat for customer bills.

We have submitted our PR24 plan which reflects the need to adapt to the future impacts of climate change to Ofwat. Ofwat is currently considering what funding will be allowed and what activities we will deliver over the plan period. We expect Ofwat to make its determination on funding in December 2024.

Since ARP3 we have undertaken some high-level work to better understand what we believe are the key interdependencies for delivering water and wastewater services to our customers that could in the short-term be impacted by weather events and in the longer-term climate change. As part of this work, we have cross referenced the CCRA3 and National Adaptation Programme 3 (NAP3) and developed an interdependency risk categorisation criterion to help begin to prioritise the different risks (see **Interdependencies** and **case studies**).

Climate change governance (1)

We consider and manage a range of climate related risks and opportunities through our Enterprise Risk Management Process and strategic planning.

Climate change is one of our Strategic Principal Corporate Risks and it is sponsored at the Board level by our Chairman. It is formally considered and challenged at least quarterly via business units' Leadership Team risk reviews; the Executive Risk Committee; and the Audit, Risk and Reporting Committee (ARRC).

We are evolving our understanding of the interconnectivity of climate change risks and opportunities, and how best to manage these, so climate change risk and its management is fully integrated into our wider strategy.

Managing our risks to support sustainable success

We have a robust approach to considering and managing our risks so we can deliver our Purpose and objectives, while also managing our risks, including climate change, to an acceptable level rather than eliminating them completely.

We operate an Enterprise Risk Management (ERM) framework that is embedded across the business. As part of our risk management process, we identify, assess, and agree mitigation options for climate related risks. We disclose these risks in documents such as our Water Resources Management Plan, Drainage and Wastewater Management Plan and Climate Adaptation Report.

Since our ARP3 submission we have further enhanced our ERM framework and tools so that risk management forms a fundamental part of our decision making. We proactively manage our risks so we can quickly identify and adapt to the dynamic environment in which we operate. Our ERM Framework encompasses our values and behaviours, encouraging timely and transparent risk reporting to create an effective risk culture. This is supported by a strong, consistent tone from the top which is cascaded throughout the business.

Enterprise Risk Management Process

Our risk management process centres on a clear and simple approach, aligned to the ISO 31000:2018 risk guidelines (see Diagram 1). It provides a consistent end-to-end process to all business units, as well as integrating activities with the Executive Team and Board to align with our Turnaround Plan and our WRMP and DWMP and PR24 plans.

Managing climate risk

Diagram 1: Risk management process

Climate change governance (2)

Managing climate risk

Risk oversight and governance

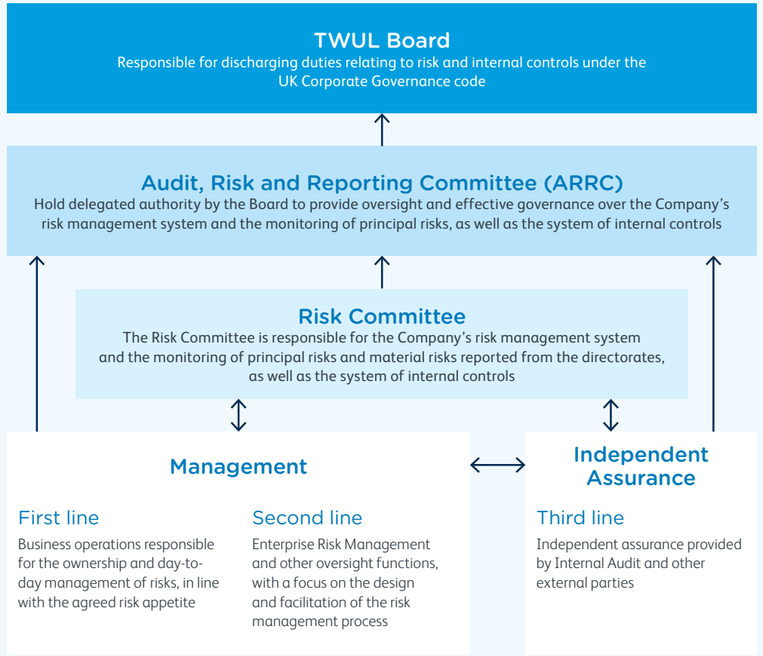
Embedding a clear and consistent approach to risk oversight and governance is key so that risk management is effectively implemented across the business. The Board has overarching responsibility for ensuring the effectiveness of the risk management and internal control systems, supported by the ARRC, which maintains oversight over the principal risk landscape and how the business is responding. We follow the established Three Lines Model to enable an effective relationship between risk, control and assurance, ensuring clear accountability and responsibility (see Diagram 2).

Climate Change Working Group

In 2022, we set up a Climate Change Working Group. The objective of the Climate Change Working Group is to provide oversight and effective governance of our approach to managing climate change with a focus on ensuring compliance with relevant statutory and regulatory obligations and reporting. This includes, but is not restricted to, the five-yearly Periodic Review, Water Resource Management Planning, Drainage and Wastewater Management Planning, our Adaptation Reporting Power response, TCFD, and our Net Zero transition plans.

The group is led by our Asset and Engineering Director and includes senior representation from Asset Operations and Capital Delivery, Corporate Finance, Investor Relations, Risk, Sustainability, Strategy and Regulation and Energy and Carbon teams. The group reports to the Executive Committee and the Board's Health, Safety, Environment and Sustainability Committee.

Diagram 2: Risk governance structure



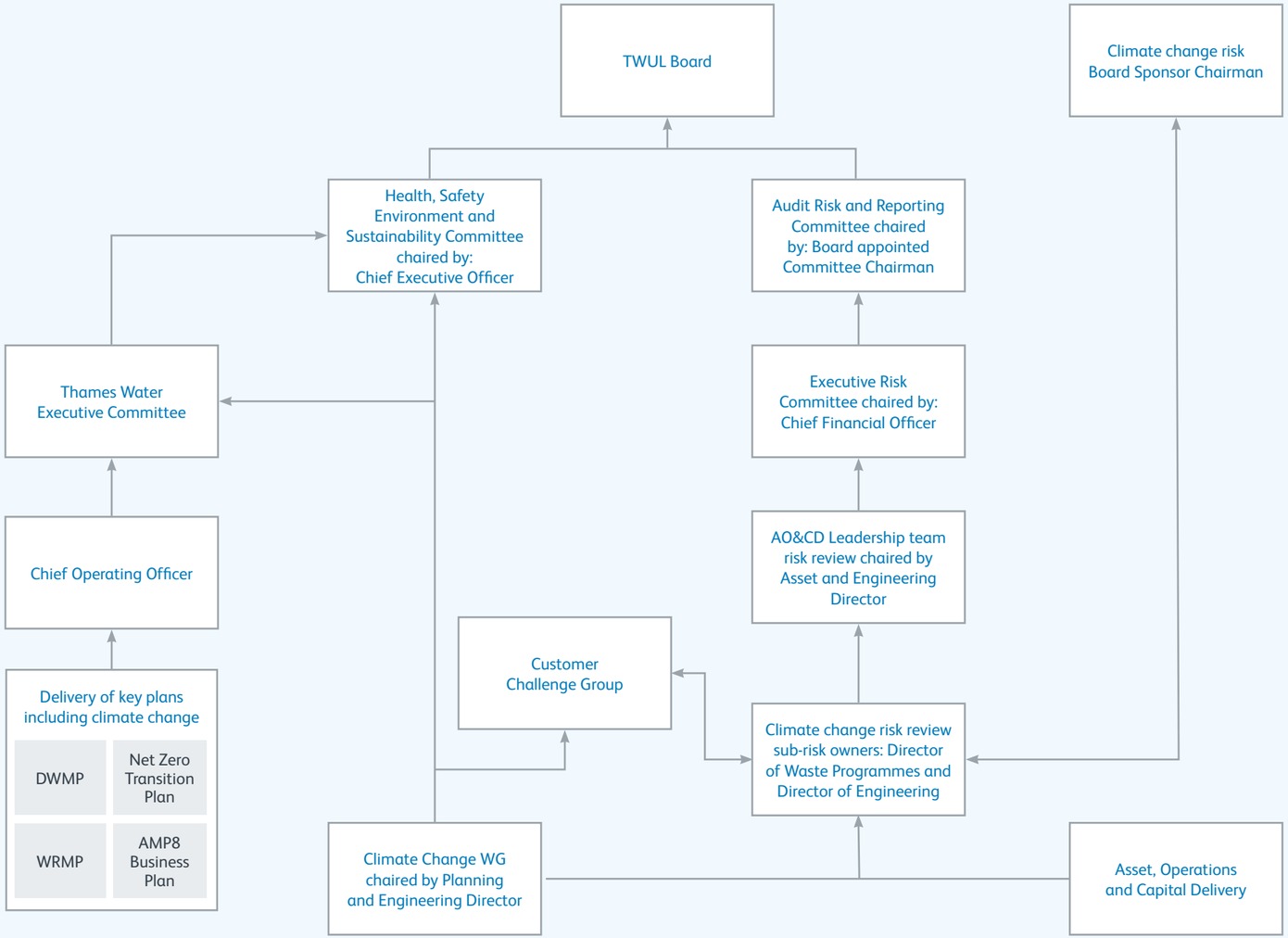
Climate change governance and delivery

Our Board is responsible for the long-term success of Thames Water by providing leadership, and establishing the company's Purpose, strategic direction and values. It provides governance oversight and supports effective management of risk. It balances the interests of our shareholders with those of our wide range of other stakeholders including customers, employees, bondholders and suppliers and the impact on our communities and the environment.

Our approach to governance is consistent with Ofwat's Board leadership, transparency and governance principles 2019.

Exact deliverables of climate change related outcomes and timing will be confirmed following the final determination from Ofwat who are expected to make a final determination in December 2024.

Managing climate risk



Keeping the taps flowing

Securing safe and sustainable water supplies

We supply over 10 million customers with more than 2.5 billion litres of clean and safe drinking water every day. Climate change, a growing population, and the need to reduce the amount of water we take from our rivers and chalk streams to protect the environment, are the three key factors which threaten the security of water supply.

Every five years, water companies publish and agree Water Resources Management Plans (WRMP), setting out how they intend to provide a secure water supply for their customers in the context of climate change and the need to protect and improve the environment.

The proactive steps we are taking to deliver water resources are driven by the findings set out in Thames Water's **Water Resources Management Plan** (which has now been signed off by the Government) and the **South East's regional draft Water Resources Management Plan**. The plans outline the severity of the challenges we face in both the Thames Valley and the wider South East. Because this is a shared issue, we work collaboratively with other water companies in the region to identify the right solutions.

Our plans

With the challenges of climate change and population growth, it's more important than ever that we have a robust plan to secure our water supplies for the future. We forecast that if we take no action, we face a shortfall of over 1 billion litres of water every day for our customers in the next 50 years. That's enough to fill around 400 Olympic sized swimming pools. The impacts of climate change contribute 198 Ml/d or 20% of this shortfall.

Leakage is an important challenge we need to address. Although in 2023/24 we reduced leakage by 7%, to our lowest ever level, we know we have more to do, and reducing it further is a key element of our WRMP.

As well as reducing leakage and our own personal consumption levels, investment in new infrastructure is vital to ensuring we can keep everyone's taps running in the future. Thames Water's Strategic Resource Option (SRO) team is developing proposals for new nationally significant infrastructure projects (NSIPs), so that drought management solutions are in place when they are needed, not when crisis hits.

Planning to avoid future water shortages

We know that climate change is increasing the risk of severe drought events in the UK, which are now expected to be much worse than those in 1976 and 2022.

While winters are forecast to be warmer and wetter, summers will be hotter and drier, and more frequent and intense weather extremes are predicted. Coupled with an increased demand for water as our towns and cities expand, the viability of our water supplies during dry periods is fragile.

It's vital that we plan for future droughts now. This means learning to manage and use water more wisely and, critically, increasing our storage capacity and developing new sources of water.

A reliable water supply is usually taken for granted, but not having enough water could mean:

- Schools and businesses being closed
- Water restrictions or rationing, for example relying on standpipes in streets
- Having to abstract more water from rivers and streams, impacting habitats and wildlife
- Decreasing crop yields and higher food prices

Keeping the taps flowing

Our WRMP describes the plans in place to reduce water leakage from our network and customers' pipes, and the government has pledged policy measures to support water companies to encourage customers to use water wisely. But on their own, these initiatives are not enough. We will need to increase our water storage capacity and develop new sources of water. Recognising the potential scale of the water shortage crisis, the government, our regulators and water companies are working together to plan new large-scale water storage and supply solutions.

Looking ahead

Like every water company, we must prepare and maintain a Water Resources Management Plan (WRMP). This plan sets out how we will achieve a secure supply of water for our customers whilst protecting the environment. WRMPs are long-term plans that require us to forecast future scenarios using a range of data.

The further ahead we look the more uncertain the future is, and we take this into account by using an adaptive planning approach. This allows us to identify the different potential options we could require.

Regional thinking

Through Water Resources South East (WRSE), we're also working with the other five water companies that supply the region's drinking water. We have developed a joint plan that addresses the climate and environmental emergency threatening our water resources. This collaborative approach means we can look beyond our individual boundaries and work together to secure the region's future water supplies. **See Regional water resources case study p37** for more information.

Our long-term plan

Our latest WRMP sets out that, if we do nothing, we could face a shortfall of over 1 billion litres of water per day by 2050 of which 140Ml/d is due directly to the impacts of climate change. A further 320 Ml/d of shortfall is associated with providing resilience to a 1 in 500-year drought. To meet this shortfall, we must make the best use of the water we've got by tackling leakage, reducing demand and investing in new strategic sources of water.

We asked our customers for their views on the plan during our public consultation. How we reflected these views can be in our Statement of Response that we published at the end of August 2023, which you can find here.

Keeping the taps flowing

In September 2024 we secured government approval of our WRMP, which sets out our strategy to provide a secure and sustainable water supply for the next 50 years.

Our latest WRMP has been sign-off by the Secretary of State for Environment, Food and Rural Affairs can be found at Water Resource Management Plan 2025-2050 .

Strategic Resource Options

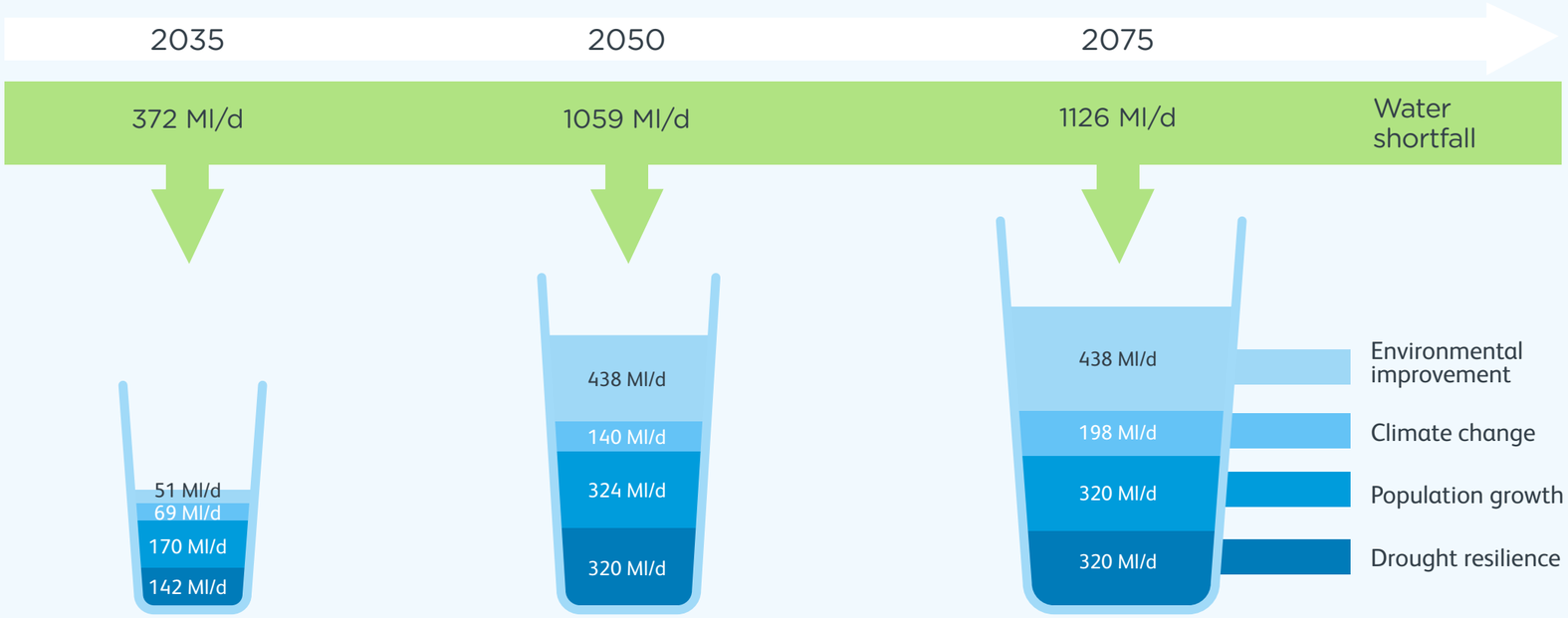
Every day we turn on our taps to fill glasses of water, make cups of tea, wash, cook, and clean. We rely on water to run our schools, hospitals, essential services, and businesses. We need it to keep the world around us healthy too.

We have plans in place to reduce water leakage from our network and customers' pipes that will halve leakage by 2050, and the government has pledged policy measures to support water companies to encourage customers to use water wisely.

But on their own, these initiatives are not enough. We must increase our water storage capacity and develop new sources of water.

Recognising the potential scale of the water shortage crisis, the government, our regulators and water companies are working together to plan new large-scale water storage and supply solutions.

In our WRMP that has been agreed by the Secretary of State for Environment, Food and Rural Affairs, we have identified and developing three different new sources of water that will address the challenges of climate change, population growth and drought. These options are described in more detail in the following pages.



South East Strategic Resource Option (SESRO)

Keeping the taps flowing

The proposed new reservoir is to the south-west of Abingdon. It would draw-in water from the River Thames during winters, storing it until it is needed – when the weather has turned dry or demand for water increases. Our proposals would provide customers with a drought insurance policy for the next century and beyond. The 150 million M^3 reservoir once completed by 2040 could supply 271Ml/d of water equivalent to 3 million baths.

We're part way through a process of preparing designs for the new reservoir. And we're on track to submit an application for development consent to the Planning Inspectorate in 2026, seeking the powers to build the new reservoir.

We're engaging stakeholders and local communities as we go, to understand priorities and gather important information and feedback which will all be considered and will help to shape our proposals.

When completed the reservoir will not only benefit our customers but also neighbouring water companies Southern Water and Affinity Water, the environment, and the wider South East of England. The costs to develop and operate the reservoir will be shared with those organisations that benefit from it. The Secretary of State for Environment, Food and Rural Affairs concluded that the SESRO was a nationally significant strategic need in securing drinking water supplies for millions of households and businesses across the region when he signed off our WRMP in September.

Discover more about SESRO

To take a virtual tour of our proposed new reservoir

Teddington Direct River Abstraction (TDRA)

Keeping the taps flowing

Working with Water Resources South East (WRSE), we have identified that the TDRA solution which could provide up to 75 million litres of water each day during periods of prolonged dry weather, to help protect London from the risk of drought. The Secretary of State for Environment, Food and Rural Affairs concluded that the TDRA is a nationally significant strategic need in securing drinking water supplies for millions of households and businesses across the region when he signed off our WRMP in September 2024.

Water would be abstracted from the river upstream of Teddington Weir and transferred along a section of new connecting pipeline to an existing underground tunnel to our reservoirs to become drinking water.

The abstracted water would be replaced with recycled water from Mogden Sewage Treatment Works in Isleworth, transferred to the river along a new underground pipeline to an outfall structure upstream of Teddington Weir. This way, we will be able to access additional supplies of water from the river, while ensuring river levels are maintained and the river environment and ecology protected.

Find out more about TDRA proposal here

Water Transfer Projects

Keeping the taps flowing

We are working collaboratively with other water companies and are considering three new water transfer options. These options look to move water from higher availability to areas of lower water availability. These options include:

The Thames to Affinity Transfer (T2AT) – would move water by underground pipeline from the River Thames to Affinity Water's region once a new source of water (the proposed reservoir in Oxfordshire) has been developed.

Construction of the necessary T2AT infrastructure would be in two phases. The first phase of the project would be ready and operational by 2045. The second phase would be operational by 2050.

The Thames to Southern Transfer (T2ST) – would move water by underground pipeline from the River Thames to Southern Water's region once a new source of water (the proposed reservoir in Oxfordshire) has been developed. Construction of the necessary infrastructure would be up to 2040, with water available once the reservoir is built.

The Severn to Thames Transfer (STT) – is part of the adaptive plan set out in our WRMP and could be developed if we need additional water in the future.

STT would transfer water from the North West of England and Midlands to the South East of England for use during a drought. This water would come from the River Severn itself, with Severn Trent Water and United Utilities providing additional sources of water if needed. The water would then be moved from the River Severn to the River Thames either by a new pipeline or by a combination of new pipeline and restoring the Cotswold canals.

Find out more about our water transfer projects

Managing wastewater

Our Drainage and Wastewater Management Plan (1)

Managing wastewater

About our DWMP

Our DWMP will enable wastewater to be taken away and safely treated, reduce the risk of homes flooding and protect rivers and wetlands, while keeping your water bill affordable for the next 25 years and beyond.

River health is important to us, and we want our rivers to be wonderful places for people to relax and enjoy. There are three main factors that impact river water quality and need to be addressed*:

- Discharges from the water industry (which the DWMP will help address)
- Agriculture and rural land management
- Urban and transport runoff

We have an important role to play in achieving river health improvements and the DWMP will contribute towards this, but we can't deliver this on our own.

We are working to turnaround our business to improve our performance, and progress is being made with Ofwat now rating us as an average performer in its **2024 Water Company Performance Report**. We know the areas that we need to continue working on that will help address the increasing expectations from our customers, and long-term challenges such as climate change and population growth. Our plan continues the task of addressing the historically under investment in our ageing network. It will improve our readiness to meet the twin challenges of climate change and population growth, while protecting the environment and continuing to deliver life's essential service.

It's the first time a long-term plan for wastewater (covering the period 2025-50) has been co-created with Customers, National and Regional stakeholders and regulators to deliver a resilient and sustainable wastewater service. Between 2019 and 2023 we engaged and worked with around 2,000 customers and stakeholders to develop our plan.

Based on the national DWMP framework developed jointly by regulators and industry bodies including Ofwat, Defra, the Environment Agency, Water UK, Welsh Government, Natural Resources Wales, Consumer Council for Water, Association of Directors of Environment, Economy, Planning and Transport and Blueprint for Water, the DWMP creates a roadmap for how we adapt our wastewater service to cope with future challenges. More information about the framework can be found **here**.

Our DWMP sets out the risks and pressures for our drainage and wastewater service. These are climate change, population growth and protecting the environment. The DWMP has fed into the draft PR24 business plan submitted to Ofwat that is currently under consideration. Adaptive planning including climate change is integral to our approach to developing our DWMP. As with the WRMP we have looked at adaptive pathways planning in the context of RCP2.6 and RCP8.5 which model possible future climate evolution. More detailed information can be found in **Appendix G** of our DWMP.

Our wastewater service

Every day we collect and treat around 5.1 billion litres of wastewater from nearly 16 million customers, through 109,000km of sewers, to be treated at our 352 sewage treatment works and then return treated water safely back to our local rivers. Delivering this service is getting more difficult, and we know we've got a lot to do to get our wastewater service right.

Over the last five years, we've been working with our customers and stakeholders to develop a DWMP based on our shared priorities. Its aims are to:

- Have less homes that are at risk of flooding than there are now
- Improve our rivers by reducing the amount of time storm overflows discharge into them
- Bring more nature into our towns and cities
- Keep customer bills affordable

Pressures

Over the next 25 years, climate change will impact the weather patterns across our region. Extreme weather, such as heatwaves and flooding, will become more frequent and severe, with summer rainfall projected to become up to 20% more intense because of climate change. At the same time our region's population is predicted to grow by 2.5 million people by 2050. We also need to protect and enhance our natural environment, particularly the health of our rivers and wetlands, while balancing the costs of meeting environmental standards and keeping customer bills affordable.

* **theriverstrust.org/rivers-report-2024**

Our Drainage and Wastewater Management Plan (2)

Managing wastewater

Impacts

If we don't act and deliver the DWMP, then by 2050, our assessment has identified serious impacts for our customers and the environment including:

- Sewer flooding – Where growth and climate change could put an additional 187,000 properties at risk of flooding in a 1 in 50-year storm
- Storm discharges – By 2050, growth and climate change would also have an effect, resulting in 45% of wastewater catchments having an unacceptable number of storm discharges
- STW resilience – By 2050, the permit compliance of our STWs in almost half of our catchments (44%) could be at risk

Our DWMP goals

To keep toilets flushing, reduce the risk of homes flooding and protect rivers and wetlands, we will:

Reduce sewer flooding to properties by stopping property flooding internally (within the home or business) and externally (outside the home or business) from our sewers where possible, up to a 1 in 50-year storm event.

Reduce storm discharges of untreated sewage and environmental impact by discharging no more than 10 times per year on average, per storm overflow, and no more than three in designated bathing waters, by 2045.

Increase sewage treatment works resilience by enhancing the ability of our sewage treatment works to recover from difficulties, without impacting our service or the environment.

Find our full DWMP report here

Working in partnership

Since ARP3 we have developed and consulted on our first DWMP. In co-creating the plan, we worked with around 2,000 customers and stakeholders from national, regional and local levels (see panel below). We facilitated around 1,000 hours of interactive engagement activities. Because engagement was challenging during the Covid-19 pandemic we needed to be innovative and so we used a blend of digital and face-to-face methods to gain stakeholder views.

Customers	Stakeholders	Regulators
Domestic	Customer Challenge Group (CCG)	Consumer Council for Water (CCW)
Business	Local authorities (planning, flooding and highways)	Environment Agency
Future	National authorities	Natural England
Older	Catchment Partnerships	Ofwat
Living in vulnerable circumstances	Thames Regional Flood and Coastal Committee strategic partnership areas	Defra
	Local environmental action groups	National steering groups
	Land and riparian owners	
	Other organisations (e.g. TfL)	
	Industry practitioner groups	

Adaptive planning

Managing climate change uncertainty

The future timing, extent and frequency of change are uncertain, which make planning for the future challenging. We have therefore taken an 'Adaptive Planning' approach which uses a mixture of 'no and/or low regrets' short-term investments in conjunction with longer term investment options/ pathways that provide flexibility depending on how the future evolves.

As part of the 2024 price review (PR24), we have set out 25-year plans showing how we intend to meet our long-term ambitions. We have put adaptive planning at the heart of our planning approach. We have also considered low/least regret options, modular solutions, enabling investment and actions. Our plans are adaptive because they accommodate where different solutions may be required to achieve our vision as the external environment changes.

We have a series of long-term plans that have been developed and iterated over several years, including in:

- Our latest Water Resource Management Plan (WRMP) has been signed-off by the Government. It reflects the Water Resource South East's (WRSE) regional plan, setting out how we intend to provide a secure and sustainable water supply over the next 50 years
- Our Drainage and Wastewater Management Plan (DWMP) developed collaboratively with other organisations and groups that have a shared responsibility and/or interest in drainage, flooding and environmental protection. The plan sets out how we will enhance our assets and networks over the next 25 years

In developing our plans, we have considered a wide range of future scenarios, including climate change, population growth, abstraction reductions and environmental ambition.

For the purposes of our PR24, submission for the period 2025-30, we have tested our plans against Ofwat's eight 'common reference scenarios' to identify a 'core pathway'. The core pathway is a series of 'no and/or low regrets' investments / activities that are required:

- in both benign and adverse scenarios;
- across a wide range of plausible scenarios; or
- need to be undertaken to meet short-term requirements

Importantly, the core pathway also includes investments required to keep future options open (such as enabling work or learning and monitoring). In addition to the core pathway, we have identified a series of alternative pathways which comprise a series of investments / activities that are required to meet our 2050 outcomes should specific external trigger events occur.

We have identified a 'best value pathway' which sets out a potential profile of expenditure across enhancement areas over the long-term to set us on a trajectory to achieve our vision for 2050. This plan reflects the result of our extensive planning processes, including our WRMP and DWMP, testing a wide range of scenarios, and ensuring sufficient resilience to a wide range of factors. More detail can be found in our Long-Term Delivery Strategy produced as part of the PR24 Business Plan.

Adaptive planning

	Adverse scenario	Benign scenario
Climate change	RCP8.5, 50th percentile probability level	RCP2.5, 50th percentile probability level
Technology	Faster technology scenario	Slower technology scenario
Demand	High demand scenario	Low demand scenario
Abstraction	High abstraction reductions scenario	Low abstraction reductions scenario
Wider scenario testing	Relevant factors not specified in the reference scenarios	

Ofwat common reference scenarios

Monitoring and evaluation

We are developing our approach for a monitoring and evaluation framework and metrics that will inform and influence strategic decision-making, investment timing and plans for WRMP29, DWMP29 and PR29.

Planning to adapt to climate change is inherently uncertain and our approach will need to be flexible and support learning and continuous improvement based on what emerges over time.

As part of our strategic planning to respond to the impacts of climate change on our activities we have adopted an adaptive planning approach. Because the timing and extent of climate change is uncertain, we have considered different scenarios of climate change within our adaptive planning. Using an adaptation pathways approach will allow us to be flexible if future impacts and timings are different than anticipated and robust and efficient under a wide range of potential climate futures.

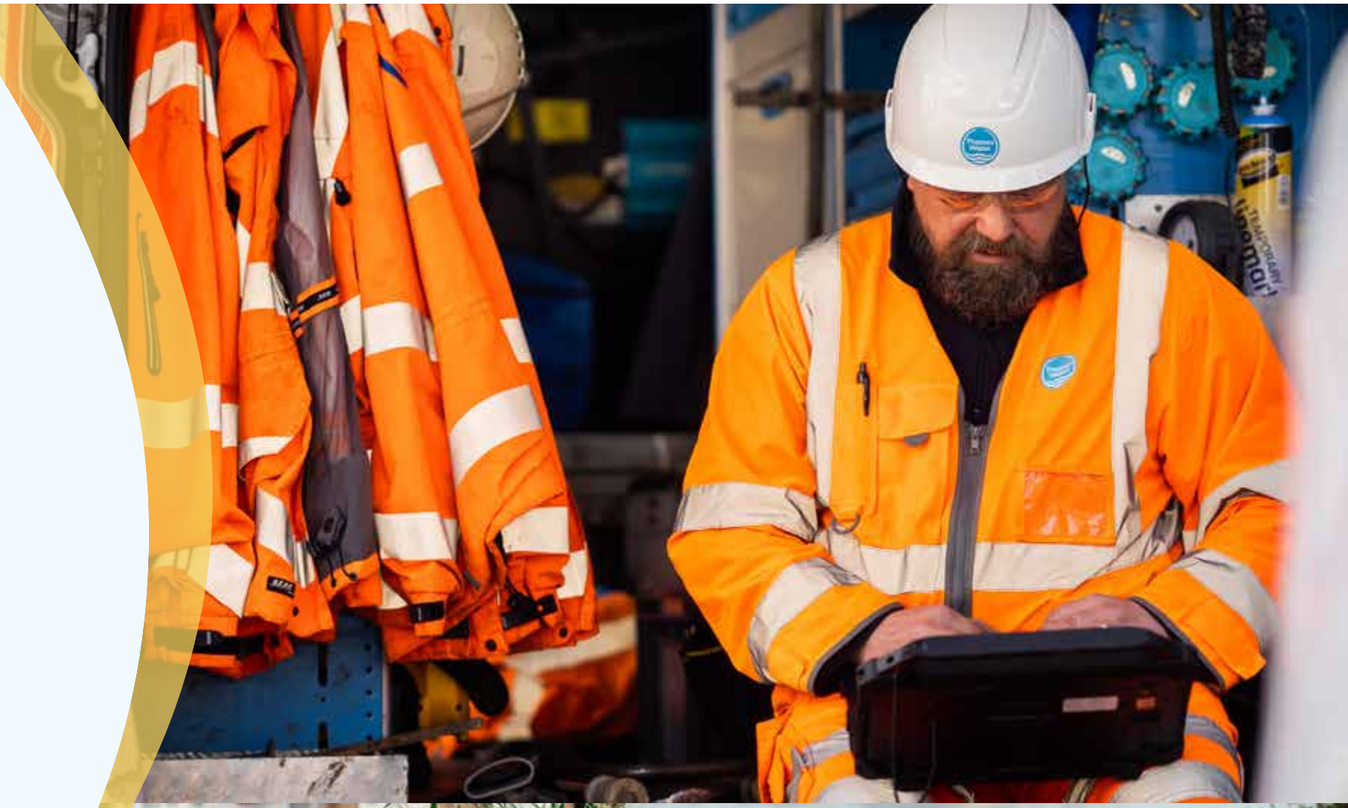
We have identified the key groups responsible for climate change governance and delivery **(see p16)** who will either be influenced by or have influence on the monitoring and evaluation framework and metrics.

However, there is no single set of climate change adaptation indicators as the need to adapt is context specific. We are a data rich organisation but the big challenge we will have, is to identify and understand the most appropriate indicators, or mix of indicators, for demonstrating meaningful measurements of progress.

We will need to be proportionate and realistic about the development and application of our monitoring and evaluation framework and clear about any limitations of data used. In developing our monitoring and evaluation framework we will have to balance our ambition with what is feasible given the available time, capacity and budget.

Adaptive planning

Interdependencies



Working with others

Interdependencies

While reviewing our assessment of climate change impacts and interdependencies for ARP4 we have undertaken some high-level work to better understand what we believe are the key interdependencies for delivering water and wastewater services to our customers that could in the short-term be impacted by weather events and in the longer-term climate change.

We have created a list of interdependencies drawing on information from our own risk assessment, engagement with other water companies and other sectors including energy and transport. Table 1 lists the interdependencies we have identified across: area, potential impact, potential impact on Thames Water, cascading risks, and the potential impacts on other sectors. We also cross referenced the CCRA3 and NAP3. We developed an interdependency risk categorisation criterion to help begin the prioritisation of the different risks. We have found that some risks can become more critical the longer the duration of an event (e.g. weather) lasts or the longer it takes to deliver remedial solutions (e.g. response). Changes in the stability of the distribution network due to variations in voltage e.g., from increased renewables connection can lead to a negative impact on our operations.

The information in Table 1 represents our current view of interdependency impacts if no action was taken. We acknowledge that there is a need to further evolve our understanding and to work with other organisations and sectors on ways to highlight challenges and find ways to reduce potential impacts. We also need to better understand the implications of event duration and geographical extent.

Since ARP3 we have engaged with a wide range of sectors, organisations, groups and activities to better understand interdependencies and plan for potential impacts of interdependencies including:

- Energy Companies
- Mighty Oak National Power Outage exercise
- Distribution System Operators
- Telecoms providers
- Other Water Companies
- Local Resilience Fora
- Thames Regional Flood and Coastal Committee
- Lead Local Flood Authorities
- National Chemical Steering Group
- Water Sector National Incident
- Management Water Sector Operational Strategy Group
- Tier 1 Suppliers
- London Surface Water Strategy Group
- London Surface Water Strategy
- Drain London Partnership
- Transport for London
- Defra
- Drinking Water Inspectorate
- Environment Agency
- Ofwat

Table 1 Potential Interdependencies and impacts

Making connections

An impact can have many different causes e.g., a power outage can be caused by faulty equipment in the power network, damage caused by a third party or damage caused by an extreme weather event. Although the causes are different the impact is the same i.e., loss of power at a point in the system.

Anything that causes an impact on our ability to deliver service to our customers can have an impact on other sectors as shown in **Table 1, p30**. Unlike the power network where electricity is either flowing or it isn't, any loss of power does not immediately impact customer service from our system. However, even with some inherent buffering in our system before impacts are seen, it is generally only a matter of hours rather than days.

Contingency plans can help manage some impacts in the short-term e.g., on-site generators, but these can be impacted by cascading interdependencies e.g., lack of availability or priority for fuel. A resilient response is not always in the gift of a single organisation. Whilst mitigations can be put in place, they can sometimes also fail, and an extended event duration can further compound any impact. There are those responses that are in our control and those which are in the control of third-party organisations.

The impact of weather events, interconnectivity and compounding issues became very real when in November 2023 Storm Ciarán caused power fluctuations in the electricity grid which caused power outages at five water treatment works. As a consequence, there were unacceptable knock-on impacts on customer service that were felt for 12 days after Storm Ciarán. See **Power resilience case study, p41** for more information.

Our supply chains are critical to delivering the essential service to our customers. Anything that causes disruption to them including weather events and climate change can impact on customer service. We have learnt a lot about the resilience of our supply chain and associated interdependencies from recent events including planning for Brexit, the Covid 19 Pandemic and challenges to key chemical availability. Supply chain issues are monitored on a weekly basis through the water sector National Incident Management which provides a traffic light status for the whole industry for a range of areas including Customer Impact, Water Resources, Supply Chain, Cyber, Weather and Mutual Aid. This allows early identification of issues to develop responses and the deployment of responses. For more information see the **supply chain case study, p42**.

Interdependencies

Progress since ARP3

In our ARP3 submission, we identified a range of metrics and outputs that would contribute towards Thames Water becoming more climate change resilient and are consistent with CCRA2 challenges. We have made good progress in delivering on these goals including:

- Development, consultation, publication and sign-off by the Secretary of State for Environment, Food and Rural Affairs of our Water Resource Management Plan
- Actively contributed towards the development of a regional Water Resource Management Plan
- Publication of our co-created Drainage and Wastewater Management Plan
- Embedded climate change into our PR24 Business Plan submission
- Increasing the amount of surface water disconnected from the public sewer
- Met our target for risk of sewer flooding in a storm
- Reduced annual average leakage to its lowest ever level on our network (year 2023/34)
- Installed nearly 470,000 new smart meters since April 2021
- London Tideway Tunnels on track to become operational in 2025 which will improve our climate resilience
- Over 450,000 customers on our Priority Service Register who receive extra support if service impacted e.g. from an extreme weather event

For more information about our delivery progress since ARP3 see our Annual Performance Report 2024.

Our proposed five-year plan from 2025-30*

We've set ourselves a tough challenge. Our ambition is a world where we've learnt from the past and adapted to the future to improve our service for you and the world around you. We've developed our AMP8 plan through extensive engagement with our customers, our communities, our Customer Challenge Group, our supply chain and the active involvement of our Board.

Our response to Ofwat's PR24 Draft Determination* reflects the need to adapt to and become resilient to the future impacts of climate change.

Our proposed Business Plan 2025-2030* included the following:

- £20.7 billion total spend across our business (along with an extra £3 billion through gated mechanisms), as we strive towards meeting the expectations of our customers
- Preserving a reliable supply of safe, clean, wholesome drinking water, with minimal disruption
- Reducing leakage by 21% (based on a 2020 baseline) to an annual average of 407.7 Ml/d in 2029/30
- Replacing over 570km of water mains, focusing on those mains which are in poor condition or have high levels of leakage
- Delivering water security for this and future generations, including consulting and planning for a new reservoir near Abingdon
- Upgrading 150km of sewers to lower the risk of sewer collapses
- Reducing storm overflows by 34%
- Opening the Thames Tideway Tunnel, London's "super sewer", the third phase of improvements that will increase the health of the river by reducing combined sewer overflows into the tidal Thames by c.95%
- Providing over 647,000 households with meaningful support with their water bills

Investment

A record level of investment

For Communities

Having a positive impact

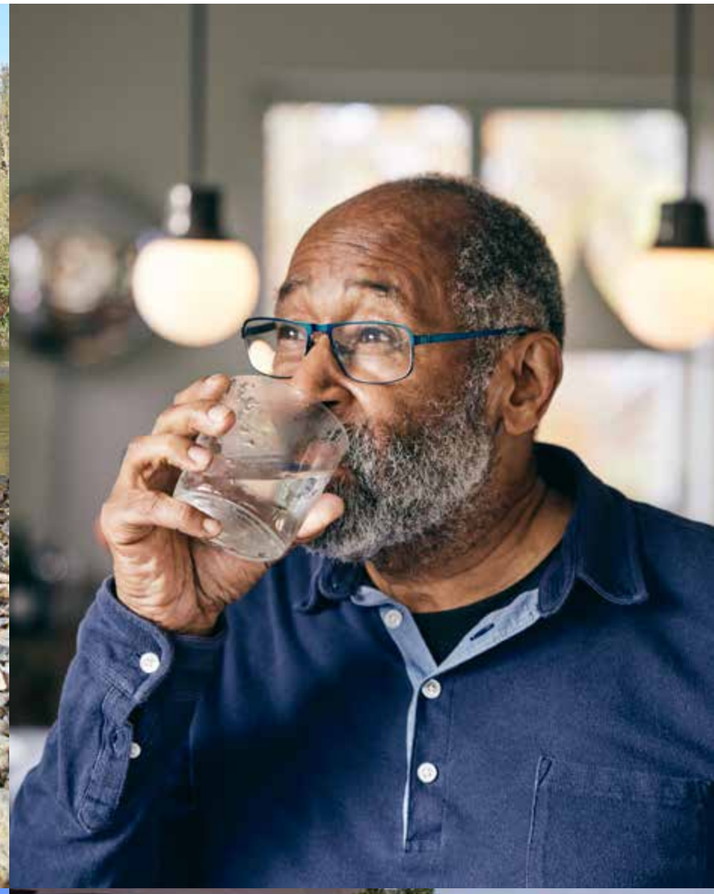
For Customers

A safe and reliable service

For the Environment

Improving the environment

* Ofwat is now considering our response to its PR24 Draft Determination and is expected to make a final determination in December 2024.



Case studies

Bringing actions to life

In this section we have ten case studies that illustrate activities and actions we are taking that help manage the impacts of climate change.

Delivering the future

Every five years, we develop, consult on and publish our plans for the next financial planning period. We've developed our AMP8 plan through extensive engagement with our customers, our communities, our Customer Challenge Group, our supply chain and the active involvement of our Board.

We have set out our plans for the 2025–2030 period in PR24 Our Business Plan 2025–2030 submitted to Ofwat at the start of October 2023 and updated in April 2024. This plan is supported by our Water Resource Management Plan (WRMP) and Drainage and Wastewater Management Plan (DWMP) which look out as far as 2050 and take climate changes explicitly into account. Our plan was agreed by the Secretary of State for Environment, Food and Rural Affairs in September 2024.

Water

Our WRMP is a long-term plan that requires us to forecast the future that we update every five years. The further ahead we look the more uncertain the future is, and we take this into account by using an adaptive planning approach that considers a wide-range of potential futures.

Our plan covers the period from 2025 to 2075 and builds on our previous plan WRMP19. We have taken a long-term view, setting a 50-year planning period, recognising the challenges and risks that we face for future water supply. The primary objective of the plan is to make sure that there is sufficient water available to meet anticipated demands, under various weather conditions, but in particular, in dry and very dry conditions, whilst protecting the environment.

Water Resource Management Plan 2025-2050

Drainage and Wastewater Management Plan 2025-2050

Wastewater

We've also developed a 25-year DWMP with customers and stakeholders that will reduce future pressures on our wastewater service. It sets out our approach to make sure we can continue delivering our services reliably and sustainably, along with positive outcomes for our customers, communities and the environment, for generations to come.

Our sewers collect your wastewater from loos, showers, washing machines, and sinks; along with rainwater from downpipes. We treat it before returning it back into rivers and waterways. This is getting more difficult, due to our aging assets and the impact of climate change and population growth, and we know we've got a lot to do to get our wastewater service right.

The plan is designed to help protect the environment, look after the health of our rivers, improve resilience to the risks of flooding and generate wider benefits to the communities we serve. Because responsibilities for drainage are spread across a range of different organisations, collaboration across organisations has been fundamental to development of the DWMP.

Climate change and planning

Climate change is one of the biggest challenges our business is facing. Our goal is to deliver customer water and wastewater service and that our plans proportionately accommodate current and future risks such as climate change.

We have made significant assessments to understand climate related risks and opportunities, and their impact on our future plans, with more detail in our Water Resource Management Plan and Drainage and Wastewater Management Plan which cover medium-term and long-term planning assessments risk and responses. These plans directly feed into our Price Review financial plan which is submitted to our economic regulator who sets how much we can charge our customers.

As part of the 2024 price review (PR24), we have set out 25-year plans showing how we intend to meet their long-term ambitions. We have put adaptive planning at the heart of our planning approach. We have also considered low/least regret options, modular solutions, enabling investment and actions. Our plans are adaptive because they accommodate where different solutions may be required to achieve our vision as the external environment changes.

Whilst climate change is explicitly considered in these plans, it is not considered in isolation from the other significant risks that impact on our business including population growth, environmental regulation, financeability and affordability to customers.

Further detail about how we reflected climate change in our planning can be found below:

Water Resource Management Plan 2025-2050

Drainage and Wastewater Management Plan 2025-2050

Draft Price Review Business Plan 2025-2030

We also have interdependencies beyond our own operational boundary that we need to consider. We therefore actively supported and participated in the development of a regional water resilience plan by Water Resources in the South East (WRSE) whose aim is to secure the water supply for future generations, through a collaborative, regional approach to managing water resources resiliently.

Regional water resources

More detail, about the revised draft regional plan and how it was developed can be found here

Water Resources South East (WRSE) is an alliance of Thames Water and five other water companies that cover the South East region of England. Its aim is to secure South East England's water supplies for the future against a predicted shortfall of up to 2.8 billion litres by 2075, all while helping the environment to thrive and providing wider societal benefits.

The South East region is home to 30% of the UK population and contributes 30% (£627 billion) per year of the UK economy.

Developing a regional plan for the South East

We worked with WRSE, and neighbouring water companies, to coordinate a regional response to the water security challenge we face. Meeting the challenge requires a joined-up approach. This collaborative approach allowed us to take a fresh look at the challenge and how best to solve it, looking beyond the boundaries of the individual water companies to identify options that'll provide resilient supplies more efficiently and provide wider benefits to communities across the region.

The plan development included understanding where we are today and the challenge, we face in terms of water availability and demand. Long-term forecasts were developed to understand what could happen to our water supplies in the future. Using this information an adaptive plan was developed.

WRSE then identified the potential options available to secure future water supplies both physical and schemes that work with nature to help make the environment that water comes from more resilient. Options and considered how much they will cost, how much water they will provide, how they will impact on the environment and how resilient they will be to future shocks and stresses including climate change.

Using a set of criteria to assess different plans WRSE developed a best value plan. This included public value benefits as well as considering which options customers preferred. After comparing many different plans, a draft best value regional plan was prepared for consultation.

After incorporating feedback from the draft best value regional plan consultation, a revised draft regional plan was submitted to Defra on 31 August 2023.

The revised draft plan presents a regional solution containing a mix of options, balancing ambitious reductions in leakage and water consumption with the need to invest in new sources of water. The plan will make the region's water supplies more resilient and address the projected 2.8 billion litre shortfall in the region's water resources, due to climate change, population growth and increased protection for the environment.

WRSE's six-member water companies have also developed and submitted their own individual Water Resources Management Plans (WRMPs), which set out the detailed proposals for each company's supply area. The relationship between WRSE and six-member water companies is shown below.

Like individual company plans the regional plan looks ahead to 2075 and addresses the water resources planning challenges that we face. The regional plan seeks to:

- Provide enough water for a growing population and to support economic growth
- Improve the environment by leaving more water in the region's rivers, streams and underground sources
- Increase the region's resilience to severe drought and other extreme shocks and stresses
- Address the impacts of climate change on demand for water and how much is available

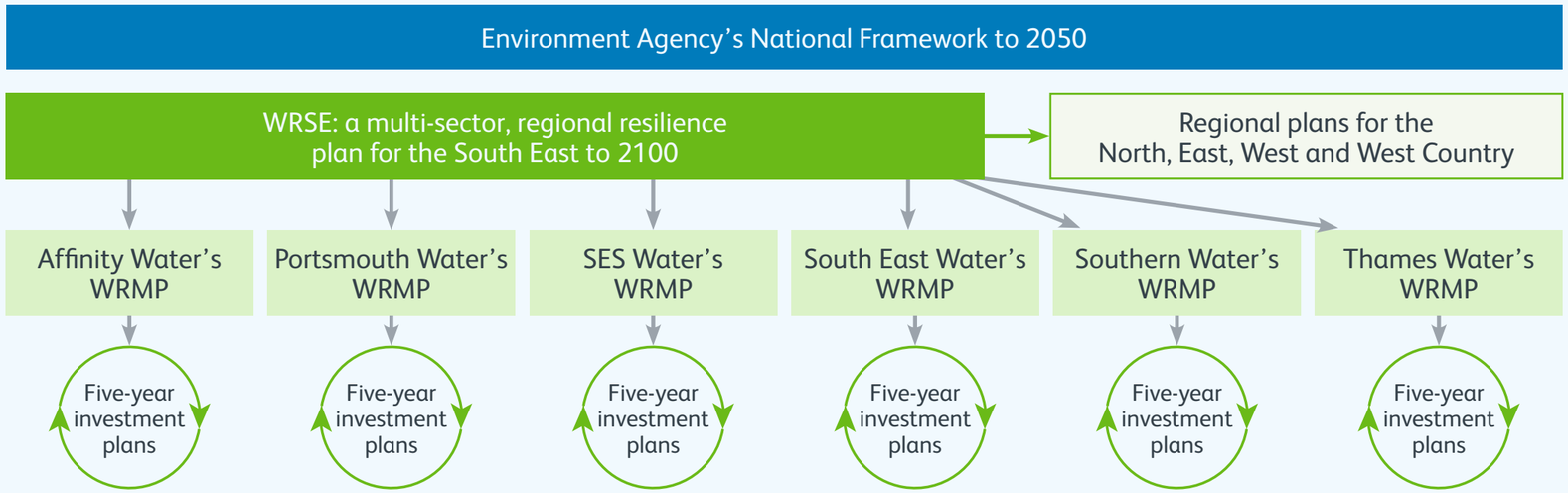


Diagram acknowledgement WRSE

Climate change adaptation

Climate change is one of the biggest challenges we face. More frequent and intense weather events across the globe will impact our business and the service we provide to customers over the coming years.

As part of our five-yearly regulatory planning cycle we already consider and manage a range of climate related risks and opportunities looking forward as far as 2075.

The potential implications of climate change on our activities are being reflected in the development of a number of key long-term company plans including:

- Water Resources Management Plan 2024. **Further detail is provided in Appendix U of the dWRMP24**
- Drainage and Wastewater Management Plan 2025-2050. **Further detail is provided in Appendix G of our Drainage and Wastewater Management Plan**
- **Periodic Review Business Plan 2025-2030.**

In addition, we have supported the development of a regional water resilience plan by Water Resources in the South East (WRSE). WRSE is an alliance of the six water companies that cover the South East region of England. Its aim is to secure the water supply for future generations through a collaborative, regional approach to managing water resources resiliently.

Using pathways to help mitigate climate change impacts

To model future climate it is necessary to make assumptions about the economic, social and physical changes to our environment that will influence climate change. Representative Concentration Pathways (RCPs) are a method for capturing those assumptions within a set of scenarios. The RCP pathways represent a broad range of climate outcomes but are neither forecasts nor policy recommendations. They include a wide range of assumptions regarding population growth, economic development, technological innovation and attitudes to social and environmental sustainability. Each pathway can be met by a combination of different socioeconomic assumptions. For example:

- RCP2.6 represents a pathway where greenhouse gas emissions are strongly reduced resulting in a best estimate global average temperature rise of 1.6°C by 2100 compared to the preindustrial period
- RCP8.5 represents a pathway where greenhouse gas emissions continue to grow unmitigated, leading to a best estimate global average temperature rise of 4.3°C by 2100 compared to the preindustrial period

For our planning we have used the UKCP18 emissions scenarios which are classified on the basis of changes to radiative forcing rather than socio-economic assessment. These projections are named RCP2.6, RCP4.5, RCP6.0, and RCP8.5, where the value following 'RCP' is the radiative forcing in 2100.

Learnings from drought

The severe drought in 2022 was caused by a drier than average winter and spring followed by an exceptionally dry summer (the sixth driest on record) with temperatures exceeding 40°C and soil moisture deficit showing record levels of dryness.

In August 2022 the Environment Agency declared a National Drought in 11 out of the 14 regions in visible drought. In response to the water resources situation changing rapidly, we implemented our Drought Plan measures in sequenced stages and on the 24th August we introduced a Temporary Use Ban or TUB which was in place until the end of November.

How the drought played out:

1. The 2022 drought saw us move through Drought Event Levels (DELs) more rapidly than expected
2. The speed at which the drought took hold was considered rapid across the wider industry
3. Its fast onset meant that we experienced multiple impacts all at once [see illustration below]

→ Six consecutive months of low rainfall led to high soil moisture deficit (SMD)

→ High SMD lead to ground movement, which increased leakage to recorded summer levels

→ Record temperatures & heatwave in July exacerbated high SMD and increased customer demand for water soaring to over 50% increase

→ High demand and temperatures resulted in a rapid drop in raw water reservoir stocks

→ Dropping reservoir levels led us to move through DEL triggers quickly

Following the drought we conducted a 'Lessons Learnt' review, consistent with our 2022 Drought Plan and proactively engaged widely with stakeholders to evaluate the plan's effectiveness and identify areas which have changed since last used and/or which require strengthening. The review identified a number of over-arching learning themes including Readiness, Early Communication, Industry Alignment that we will be investigating further.

Readiness

Improving our ability to respond quickly to an emerging drought risk through having a well informed leadership with a dedicated Incident Team, action plans and communication plans ready to go.

Early communications

Earlier communication with customers and stakeholders to help to reduce demand sooner and provide the opportunity for collaborative messaging.

Industry alignment

Improving alignment across the wider industry in the response to drought. Greater alignment when considering restriction exemptions to reduce consumer confusion.

Learning from Drought

The drought highlighted the benefits of producing an annual drought prospects report following each winter recharge period as part of our advance precautionary preparation.

Going forward our focus to improve how we plan for droughts and how we implement our Drought Plan cover six areas which will be integrated into the next iteration of our Statutory Drought Plan.

- Customer and Stakeholder Communications
- Demand Measures
- Drought Management Methodology
- Preparedness
- Drought Governance
- Supply Measures / Asset Resilience

Our Drought Plan sets out the actions we would expect to take in the event of a drought to maintain essential supplies of water to our customers while also protecting the environment. For more information on our Drought Plan please click here

More information about lessons learn from the 2022 drought can be found here

Reducing London sewer flooding

In July 2021, many of our customers' homes in central London were devastated by severe flooding after two extreme storms hit the capital. More than a month's worth of rain fell in under an hour resulting in extensive surface water flooding as our drainage systems became overwhelmed.

Whilst the storms that caused this are currently rare, they may happen more often in the future due to climate change. In areas where the flooding experienced was due to sewer flooding, we want to reduce the risk and impact of this happening to customers in the future.

For homes that were impacted by the flooding in 2021 we set up the Sewer Flooding Resilience Programme (SFRP) to provide property-level mitigation to affected homes to reduce the risk of these properties flooding again in the future. In response we have developed a £24 million two-phase mitigation programme to provide sewer flooding resilience and deliver better outcomes for our customers, communities and the environment.

To understand the issue, we undertook a survey the sewers of over 940 properties that reported flooding using our sewer flooding questionnaire.

We used this information together with the flood history of neighbouring properties to understand the risk of specific properties flooding in the future. The survey also helped us identify the best type of solution for high-risk properties.

Where properties were identified at high risk of sewer flooding, we installed a one-way non-return valve (NRV) in the property's sewer connection that significantly reduces the chance of wastewater backing up into the property. Where there is a vulnerable customer living in the property, we have installed one-way valves with a pump, known as a Flooding Local Improvement Process (FLIP). In Phase 1 which started in December 2022 and will finish in 2024/25 we are spending £14 million to protect 500 properties. As part of phase 2, we have already started work that will protect a further 260 properties from sewer flooding.

NRVs are passive mitigation devices that only allow the flow of fluids in one direction, shutting off when the sewer is full and preventing flooding from our sewers.

A FLIP is an active drainage device, essentially a micro pumping station which continues to pump waste away even if the sewer is full.

Power resilience

An impact can have many different causes e.g., a power outage can be caused by faulty equipment in the power network, damage caused by a third party or damage caused by an extreme weather event. Although the causes are different the impact is the same i.e., loss of power at a point in the system.

Anything that causes an impact on our ability to deliver service to our customers can have an impact on other sectors as shown in **Table 1 on p30**. With the power network, where electricity is either flowing or it isn't, any loss of power has an immediate impact on customers. With water provision, although the impact on our assets with a power loss can be immediate, there is some inherent buffering capacity in the distribution system before customer impacts are seen. This buffering capacity is generally a matter of hours rather than days.

Contingency plans can help manage some impact in the short-term e.g., on-site generators, but these responses can be impacted by cascading interdependencies e.g., lack of availability of replacement fuel. Similarly, whilst mitigations can be put in place they can also sometimes fail which can compound or prolong any impact. A resilient response is not always in the gift of a single organisation.

Guildford

In November 2023 Storm Ciarán caused power fluctuations in the electricity grid which caused power outages at five water treatment works around Guildford. Without power we were unable to produce potable water, and the sites temporarily shut down.

This temporary shutdown led to a drop of treated water in our service reservoirs which act like a buffer between treatment works and customers. When the power stabilised, we were able to bring most of the treatment works back into supply. However, one of the works could only operate at a reduced output as the power outage led to a failure of a pump at one of our boreholes that fed the treatment works.

At the same time the heavy rainfall associated with Storm Ciarán caused an increase in the turbidity in the raw water arriving at another of our water treatment works, Shalford, which caused water quality issues and so the site was unable to be put back into supply. This compounded the issue of reduced treated water in our service reservoirs and eventually led to water supply interruptions to customers. Unacceptable knock-on impacts on customer service were felt for 12 days after Storm Ciarán.

Following the event, we conducted an in-depth review of the incident to understand what went wrong and how we could improve the water supply resilience to our customers in this area. We identified four root causes to the impact of the incident:

1. A lack of resilience of our equipment to fluctuations in the power supply to our treatment works which caused these sites to 'trip' and a need to be reset by our engineers.
2. Insufficient number of skilled and experienced engineers, leading to an over-reliance on a small number of people.
3. Process design issues at Shalford WTW, where if the treatment process is stopped, getting it back into full operation takes time.
4. A lack of resilience across the wider Guildford water supply system, meaning that there isn't enough capacity to treat and store water to meet demands when a big WTW is out of service.

Interconnectivity

Whilst avoiding power fluctuations and outages is not under our control, we have identified some actions that will reduce impact and allow us to return to service much more quickly, including:

- Improving the resilience of the WTWs (and pumping stations) to fluctuations in power supply including remote and auto re-start options
- Increasing the resilience of each WTWs so they are more robust to shocks and stresses, e.g., extreme weather.
- Increasing the resilience of the Guildford water supply system, so that even if a WTW is temporarily inoperable, the system can maintain sufficient supply
- Increasing the number of skilled engineers who can respond 24/7 to extended incidents
- Installing temporary monitoring to allow us to better understand power issues and invested in standby generation equipment to provide power resilience

In the longer term we are exploring:

- Bringing in additional water resources from outside the Guildford area
- Working with UK Power Networks to explore provision of an alternative power supply for our biggest treatment works

This incident demonstrated a clear interdependency with the energy sector when power supply was lost, but it also demonstrated knock on impacts on water service and where we could take action and become more resilient to the loss of power however caused.

We are currently investing over £93 million in Guildford to enhance the long-term resilience of the water supply system. We will apply learning from this incident and our response elsewhere in the business.

More detail about the incident here

Supply chain resilience

Interconnectivity

Our supply chain is critical to delivering the essential service to our customers. Anything that causes disruption to them including weather, climate change and geopolitical events can impact on customer service.

We have learnt a lot about the resilience of our supply chain and associated interdependencies from recent events including planning for Brexit, responding to the Covid 19 Pandemic and challenges to key chemical availability. This learning has been integrated into how we manage our supply chains.

Company action

We have reviewed each of our procurement categories to identify which of them could impact our ability to provide clean water services and waste services in an emergency; and which of those have sole supply constraints. We have identified and implemented responses to minimise any associated risks e.g. through multiple suppliers or additional inventory.

As part of Supplier Management assurance activity, we conduct deep dives on 25% of Tier 0 suppliers annually. We review our Procurement & Supplier Management risk register every two weeks and require our suppliers to review their Business Continuity Plans (BCPs) at least annually.

Security of supply is essential when selecting suppliers so that potential interruptions are mitigated. For example, our chemical suppliers understand the inelastic and critical nature of our chemical demands and hold substantial inventory of either finished goods or raw materials to maintain supply at times of emergency/challenge.

As an industry we are Critical National Infrastructure (CNI), and so are prioritised at times of limited product availability. This prioritisation helps to shield inventory for the sector e.g. Chlorine, so that the provision of safe drinking water can be maintained.

Water sector action

Supply chain issues are monitored on a weekly basis through the water sector National Incident Management which provides a traffic light status for the whole industry for a range of areas including Customer Impact, Water Resources, Supply Chain, Cyber, Weather and Mutual Aid. This allows early identification of issues to develop responses and the deployment of responses.

When issues are identified, they are escalated to the Platinum Incident Management (PIM) and ultimately to government bodies including Defra, DWI etc. Any industry wide challenges are co-ordinated and mitigated as a collective with allocations being prioritised according to immediate need and company impact assessments.

Smart metering

When, where and how much water we use is changing. We have now installed more than 1 million smart meters across our region to improve the running of our network and better understand changing demands so we can keep taps flowing.

Our changing climate is impacting on the frequency and intensity of weather extremes like the summer drought and winter freeze/thaw, and Covid-19 has changed where and when customers work and use water.

In our water-stressed region, every drop counts, so the better we can mitigate the impact of these stressors, the better we can protect our customers and the local environment from the pressures of climate change and population growth.

With over 1 million smart meters installed we are making good progress to rolling them out across our whole patch by 2035. These smart meters record usage data every hour that's visible online for customers and for the teams at our in-sourced Smart Meter Operation Centre.

Our teams analyse 23.5 million meter readings every single day to better understand how our customers use water. In 2015 we only received 2.5 million meter readings in an entire year. This huge increase in data is enabling us to change how we support customers, combined with investment in technology to manage the data flow and make it available faster for customers.

Installing a smart meter reduces average water use in the home by 13% and it's an important tool to indicate leaks on our customers' pipes by identifying constant and unusual water flow. Last year we installed almost 140,000 new smart meters, bringing our total to over 1 million.

The data from these meters are being used to improve the accuracy of water balance calculations, educate customers on their water consumption, enable customers to self-fix their internal 'wastage' leaks, inform our Water Efficiency Smarter Home Visit (SHV) programme, engage with non-household (NHH) retailers on consumption and continuous flow volumes, and build up our database on water consumption and customer side leaks (CSL).

We have now extended the geographical coverage for smart metering by introducing technology that uses the 4G/5G network, so that we can deploy smart meters across all our region.

Since 2020 our smart metering and water efficiency efforts have saved around 60 Ml/d, enough water to supply 150,000 homes. The programme is a core part of our strategy to meet our Water Resource Management Plan and achieve our Vision for 2050, securing water resources for the future.

A future-ready workforce

Having a flexible and resilient workforce is key to turning around our business and improving our performance. To deliver this we have developed an innovative and comprehensive skills strategy to develop a flexible workforce equipped with the skills necessary to respond to future challenges including climate change.

Our approach includes focusing on social mobility, increasing diversity, early careers talent pipelines and an integrated approach to ensuring our workforce is prepared for the transition to a climate resilient economy, including;

Investing in Skills

To meet the demands of a rapidly changing environment we are investing in upskilling our workforce, specifically in areas where environment impacts our operation. Where this occurs we are integrating a focus on the impacts of climate change on our operation within our existing courses and programmes and within specific new interventions targeting the reduction of pollution events.

- Pollution Detection: Our eLearning modules include sections on identifying pollutions, with reference to the increased frequency of weather events
- Technical Training Programs: The management of water networks and water production training programs includes sections on future resilience, specifically addressing water scarcity as part of climate resilience

Inclusive Workforce Development

We understand and recognise the importance of fostering an inclusive workforce that draws on the strengths of diverse perspectives. In a challenging skills market, we are creating opportunities for underrepresented groups, expanding our potential talent pool and ensuring that our workforce reflects the communities we serve. Our strategy includes targeted recruitment from local communities and collaboration with educational institutions to create pathways into lifelong employment and learning.

Apprenticeships Skills Pipeline

Our apprenticeship programs are a critical component of our workforce development strategy. By partnering with local communities and educational sectors, we are building a pipeline of skills that will support our long-term resilience goals. These programs, including Level 6 (Degree) and Level 7 (Masters) apprenticeships, are designed to prepare the next generation of workers for careers in fields that will support achieving Net Zero and climate resilience.

We are also working with the Sustainability Academy to deliver training on the United Nations Sustainable Development Goals (SDGs). This collaboration will help our workforce understand global sustainability objectives including Water and Sanitation, Affordable and Clean Energy and Climate Action.

Social Mobility and Sustainable Careers

Our commitment to drive social mobility is central to our workforce strategy. By providing access to career opportunities, we are empowering individuals from diverse backgrounds to build successful and sustainable careers. This not only supports our operational needs to respond to climate change but also contributes to the broader societal goal of creating good work for all.

Self-Serve Learning Resources

We have developed a self-serve learning library to empower our employees to take control of their own development. The Cornerstone library includes over 90 components on Climate Resilience and Adaptation. This resource allows our workforce to access learning materials flexibly on demand, further supporting our climate resilience objectives.

Summary

Our ongoing focus on developing a flexible and resilient workforce is key to turning around our business and improving our performance. Investing further in skills development, diversity, early careers and social mobility are crucial to ensuring that we can adapt to climate change, achieve net zero, react to the changing needs of our business and provide good work for all.

Appendix A

Our updated Defra risk assessment

We completed a climate change risk assessment as part of our ARP3 update to Defra at the end of 2021 (see ARP3 p13-16 and 48-52). The ARP3 risk assessment is still considered to be valid and up to date. Importantly the risk assessment has been used to inform our major strategic plans: the Water Resource Management Plan, the Drainage and Wastewater Management Plan and the Periodic Review 24. We have, however, refreshed the risk assessment included in ARP3 to reflect progress during AMP7 and Climate Change Risk Assessment 3 (CCRA3).

CCRA3 risk (cross referenced with CCRA2 when possible)	Direct relevance to Thames Water	Likelihood of risk occurring to Thames Water	Magnitude of impact on customer service	Risk understanding	AMP7 activities	Metrics/Reporting	AMP7 update
I1 (In1): Risks to infrastructure networks (water, energy, transport, ICT) from cascading failures	Medium	Low	Low-Medium	Moderate	Make key power dependent sites more resilient to power disturbances or interruptions over three hours from the distribution network operators Increase in self-generated renewable energy to 512 Gigawatt hours Develop operational plans, Business Continuity Plans under the Civil Contingencies Act Increased exercising to build confidence and response	Power resilience DWS01 Renewable energy produced EWS03 Annual SEMD report and audit	Power Resilience see case study (Interconnectivity 1 – p41). DWS01 was stopped in 2021-22 In 2023-24 we self-generated 531 GWh of renewable energy passing the target for the end of the AMP (EWS03) Continue developing operational plans, Business Continuity Plans and relationships across all partners (Cat1/ Cat 2 under the Civil Contingencies Act, and within the water sector via WaterUK) Participation in external exercises across our whole service area. Subjects covered include London flooding, tower block fire, extreme heat, power loss, wildfire, reservoir security and COMAH site failures. Our Security and Emergency Measures Direction 2022 (SEMD) upgrade work is on target for the existing AMP7 programmes. We continue to assess the scope and requirements for an ambitious AMP8 delivery programme targeting future compliance and accounting for an evolving threat landscape
I2 (In2): Risks to infrastructure services from river, surface water and groundwater flooding	High	Medium	Medium	Moderate	Investment in AMP7 to improve overall resilience including the improvement of the resilience of water and wastewater services Ongoing investment in systems monitoring to further improve predictive capability Building on operational plans, BCP plans and relationships. Working towards increased exercising to build confidence and response. Competency model under development	Power resilience DWS01 Annual returns related to Section 18 of the Flood and Water Management Act 2010 Annual SEMD report and audit	Power Resilience see case study (Interconnectivity 1 – p41). DWS01 was stopped in 2021-22 We have reported to EA/Defra annually under Section 18 of the Flood and Water Management Act 2010 Our Security and Emergency Measures Direction 2022 (SEMD) upgrade work is on target for the existing AMP7 programmes. We continue to assess the scope and requirements for an ambitious AMP8 delivery programme targeting future compliance and accounting for an evolving threat landscape
I3 (In3): Risks to infrastructure services from coastal flooding and erosion	Low	Negligible	Negligible	Good	Watching brief	No metric	NA
n/a (In4): Risks of sewer and surface water flooding due to heavy rainfall	High	High	High	Good	Development of Drainage and Wastewater Management Plan Continue to invest in systems monitoring to further improve predictive capability Increase the amount of surface area disconnected from the combined sewer system or attenuate through SuDs Deliver performance commitments on internal sewer flooding; risk of sewer flooding in a storm; sewer collapses; and clearance of sewer blockages Develop operational plans, Business Continuity Plans under the Civil Contingencies Act Increased exercising to build confidence and response Support delivery of Thames Tideway Tunnel	Produce Drainage and Wastewater Management Plan Risk of sewer flooding in a storm DS01 Surface water management DS02 Sewer collapses CS02 Internal sewer flooding CS03 Clearance of blockages CS04 Annual SEMD report and audit Completion of the Thames Tideway Tunnel	We published our **Drainage and Wastewater Management Plan** in May 2023 We have maintained our performance and achieved our target for Risk of Sewer Flooding (DS01) An area of over 4.5 hectares of surface water has so far been disconnected from the public sewer in AMP7 (DS02) We have met our Sewer collapse performance commitment (CS02) for AMP7 Our Internal Sewer Flooding (CS03) improved for the third year running Since the last update we have continued to reduce blockages (CSO4) which also supports delivery of CS03 Continue developing operational plans, Business Continuity Plans and relationships across all partners (Cat1/ Cat 2 under the Civil Contingencies Act, and within the water sector via WaterUK) Participation in external exercises across our whole service area. Subjects covered include London flooding, tower block fire, extreme heat, power loss, wildfire, reservoir security and COMAH site failures. Our Security and Emergency Measures Direction 2022 (SEMD) upgrade work is on target for the existing AMP7 programmes. We continue to assess the scope and requirements for an ambitious AMP8 delivery programme targeting future compliance and accounting for an evolving threat landscape We expect the commissioning and handover of the Thames Tideway Tunnel to be completed by the end of 2025

CCRA3 risk (cross referenced with CCRA2 when possible)	Direct relevance to Thames Water	Likelihood of risk occurring to Thames Water	Magnitude of impact on customer service	Risk understanding	AMP7 activities	Metrics/Reporting	AMP7 update
I4 (In5): Risks to bridges and pipelines from flooding and erosion	Low	Low	Low	Moderate	Achieve performance commitments on sewer collapses	Sewer collapses CS02	We have met our Sewer collapse performance commitment (CS02) for the AMP7
I7 (In8): Risks to subterranean and surface infrastructure from subsidence	Low	Low	Low	Low	Watching Brief	No metric	This remains a watching brief risk
I8 (In9): Risks to public water supplies from reduced water availability	High	Medium	High	Good	Development of Water Resource Management Plan (WRMP) Continue to support Water Resources South East (WRSE) Strategy. A multi-sector plan bringing together not only public water supply needs but also demands from industries including energy generation, agriculture, goods and services, leisure, and each sector's resilience to future shocks to understand water infrastructure needs Produce and agree drinking water quality and safety plans to consistently demonstrate the safety of a drinking water supply using a comprehensive risk assessment and risk management approach that reflects all steps in water supply from catchment to consumer Publish new Drought Plan accommodating updated information from the latest Water Resource Management Plan assumptions including climate change All customers have a resilience to a 1-in-200-year drought, on average, over 25 years by 2030 Reduce leakage by 20.4% on a three-year average basis Publish reservoir levels and rainfall figures Achieve performance commitments on water supply interruptions; leakage; per capita consumption; mains repairs; unplanned outage; risk of severe restrictions in a drought; properties at risk of low mains pressure; responding to major trunk mains bursts; Security of Supply Index (SoSI); and installing new smart meters	Publish and consult on Water Resource Management Plan Produce Regional Water Resource Management Plan with WRSE Drinking water quality and safety plans Publish revised Drought Plan Risk of severe restrictions in a drought DW01 Security of supply index (SoSI) DW02 Leakage BW04 Installing new smart meters in London M01 Annual SEMD Audit and report	In September 2024 we secured government approval of our WRMP, which sets out our strategy to provide a secure and sustainable water supply for the next 50 years. Our **WRMP plan** explicitly take climate change into account We have worked with WRSE to produce a **Regional Water Resource Management Plan** that is consistent with our own WRMP. See Regional Water Resources case study p37 The quality of drinking water we source for the future is paramount. We have used our drinking water safety plan (DWSP) identifying hazards and hazardous events that could arise in the catchment area from the source up to the customer's tap. We have engaged with the Drinking Water Inspectorate (DWI) as part of this process We updated and agreed our Drought Plan in 2022. Our Drought Plan sets out the actions we would expect to take in the event of a drought to maintain essential supplies of water while also protecting the environment. Our updated **Drought Plan** was approved by the Secretary of State in August 2022. See also Learning from Drought Case Study p39 Improvement to the number of customers in our region at risk of water restrictions during a 1-in-200-year drought (DW01) is not currently where we want it to be. Since the summer drought in 2022, additional resource has been dedicated to improving assets resilience, modelling proactive actions and reviewing planning for severe drought restrictions In 2023-24 our SOSI (DWS02) was 99/100, we have plans to return it to 100 In 2023-24 our level of leakage figure (BW04) was the lowest it has ever been Over 320,000 new smart meters have been installed in London since April 2021 (M01) and nearly 470,000 in total Our Security and Emergency Direction 2022 (SEMD) upgrade work is on target for the existing AMP7 programmes. We continue to assess the scope and requirements for an ambitious AMP8 delivery programme targeting future compliance and accounting for an evolving threat landscape We publish **reservoir levels and rainfall figures** on our web site

CCRA3 risk (cross referenced with CCRA2 when possible)	Direct relevance to Thames Water	Likelihood of risk occurring to Thames Water	Magnitude of impact on customer service	Risk understanding	AMP7 activities	Metrics/Reporting	AMP7 update
H10: Risks to health from poor water quality and household supply interruptions	High	Medium	High	Good	Development of Water Resource Management Plan Continue to support Water Resources South East (WRSE) Strategy. A multi-sector plan bringing together not only public water supply needs but also demands from industries including energy generation, agriculture, goods and services, leisure, and each sector's resilience to future shocks to understand water infrastructure needs Produce and agree drinking water quality and safety plans to consistently demonstrate the safety of a drinking water supply using a comprehensive risk assessment and risk management approach that reflects all steps in water supply from catchment to consumer Agree new Drought Plan accommodating updated information from the latest Water Resource Management Plan assumptions including climate change All customers have a resilience to a 1-in-200-year drought, on average, over 25 years by 2030 Achieve performance commitments on water supply interruptions; leakage; per capita consumption; mains repairs; unplanned outage; risk of severe restrictions in a drought; properties at risk of low mains pressure; responding to major trunk mains bursts; Security of Supply Index (SoSI); and installing new smart meters	Publish and consult on Water Resource Management Plan Produce Regional Water Resource Management Plan with WRSE Drinking water quality and safety plans Publish revised Drought Plan Risk of severe restrictions in a drought DW01 Security of supply index (SoSI) DW02 Leakage BW04 Installing new smart meters in London M01 Annual SEMD Audit and report	In September 2024 we secured government approval of our WRMP, which sets out our strategy to provide a secure and sustainable water supply for the next 50 years. Our **WRMP plan** explicitly take climate change into account We have worked with WRSE to produce a **Regional Water Resource Management Plan** that is consistent with our own WRMP. See Regional Water Resources case study p37 The quality of drinking water we source for the future is paramount. We have used our drinking water safety plan (DWSP) to identify hazards and hazardous events that could arise in the catchment area from the source up to the customer's tap. We have engaged with the Drinking Water Inspectorate (DWI) as part of this process. This information has informed our WRMP We updated and agreed our Drought Plan in 2022. Our Drought Plan sets out the actions we would expect to take in the event of a drought to maintain essential supplies of water while also protecting the environment. Our updated **Drought Plan** was approved by the Secretary of State in August 2022 Improvement to the number of customers in our region at risk of water restrictions during a 1-in-200-year drought (DW01) is not currently where we want it to be. Since the summer drought in 2022, additional resource has been dedicated to improving assets resilience, modelling proactive actions and reviewing planning for severe drought restrictions In 2023-24 our SOSI (DWS02) was 99/100, we have plans to return it to 100 We have reviewed the experiences during the 2022 drought and incorporated learning from the event into our long-term planning including the availability of water in the Lower River Thames to refill the reservoirs in west London and the assumptions around the amount of water that can be saved from water use restrictions such as Temporary Use Bans (TUBs). See **WRMP Technical Appendix CC**. See also Learning from Drought Case Study. p39 in this report

Performance Commitment data from Annual Performance Report 2023/24 thameswater.co.uk/media-library/home/about-us/investors/our-results/2024-reports/annual-performance-report-2023-24.pdf
Note: In14: Potential benefits to water, transport, digital and energy infrastructure from reduced frequency of extreme cold events, has been removed.

Appendix B

ARP4 information sign posting

ARP4 information sign posting

Consistent with the ARP4 reporting guidance we have produced a submission that provides greatest value to Thames Water and our stakeholders. We have focused on the areas that will provide the greatest benefit in this round aligning with our statutory plans and drivers.

In this Appendix we provide links to areas of the report that are consistent with the returning organisations template in the guidance to aid navigation and cross-referencing.

- **Introduction from our CEO (3)**
- **Organisational profile (4)**

Governance, management, and strategy

- Climate change Governance (14–16)
- Top management commitment to climate change (15)
- Incorporating adaptation (7–11)
- Climate change explicit in strategic plans (17–28)
- Our approach to climate change adaptation is aligned with adaptation standards and our focus is, as a minimum, that our plans are consistent with regulatory guidance (7–11)
- We plan and report on climate change using publicly available adaptation guidance associated with adaptation management (9–11)

Understanding risks and challenges

- Our approach to understanding and managing climate risk (12–16)
- Our **ARP3 risk assessment** is still considered to be valid and up to date. It has been used in our WRMP, DWMP and PR24 planning and consistent with our approach to Enterprise Risk Management. The risk assessment included in ARP3 has been refreshed to reflect progress during AMP7.

Interdependent and cascading risks

- We have undertaken some high-level work to better understand what we believe are the key interdependencies for delivering water and wastewater services to our customers (29–31)

Adaptation action plan and implementation

- The potential implications of climate change on our activities have explicitly been reflected in the development of several key long-term company plans (25 years plus). These plans describe the measures necessary for our organisation to maintain water and wastewater services in the face of climate change impact risks. These strategic plans feed into our five yearly financial planning cycle which describes the activities we will be delivering in a particular five-year period. These plans are reviewed and updated on a rolling five-year cycle, which is effectively our action delivery plan (6–11)
- Climate change response ownership (14–16)
- Monitoring and evaluation (28)

Deliverables

- Progress since ARP3 (32) and **Appendix A**

  Soon to be implemented (by 2030) – Ofwat is now considering our draft PR24 business plan and are expected to make a final determination in December 2024 which will inform this delivery period (17–29 and 33)
- Required longer term (beyond 2030) – These are included in our WRMP and DWMP plans with a minimum 25 year forward look (10)

Case studies

- Climate change related case studies (34–44)

This edition of our Climate Change Adaptation Report was published in November 2024 and updates the disclosure made in November 2021. This is the fourth submission we've made to the Department for the Environment, Food and Rural Affairs (Defra) under the Adaptation Reporting Power requirements of Section 61 of the UK Climate Change Act (2008). We also include climate change adaptation updates in our Annual Report & Accounts, Annual Performance Report, our Sustainability Report & ESG Statement and on our website.

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