



Our final plan

Our Drainage and Wastewater Management Plan 2025-2050

Technical Appendices
Appendix A – Strategic Context

May 2023



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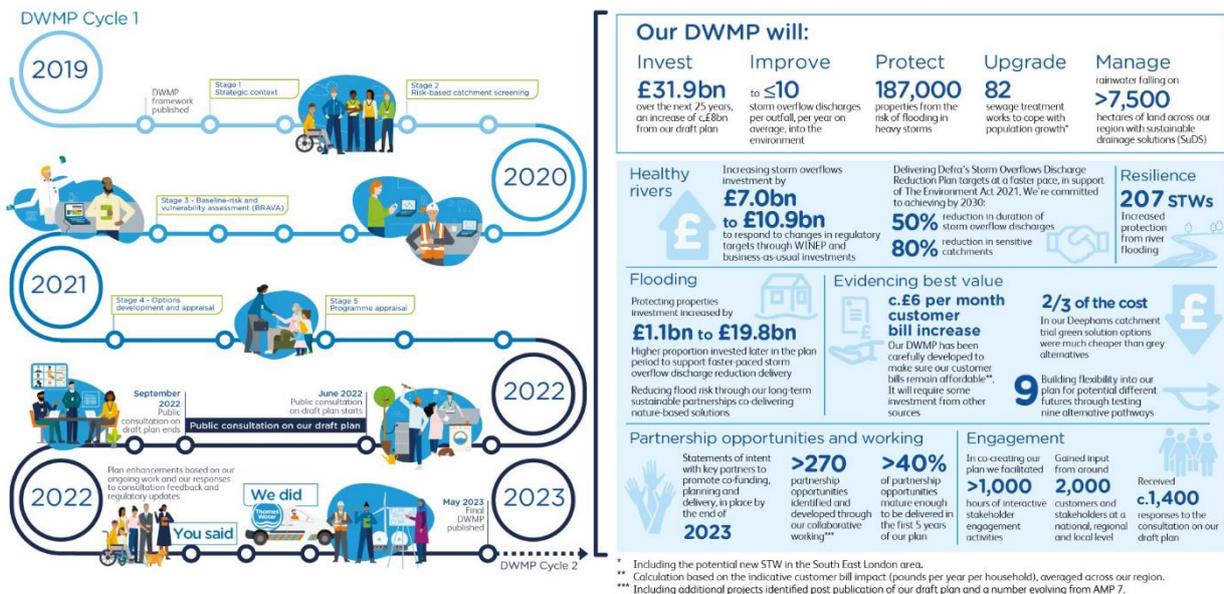
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Preface

We're proud to present our first Drainage and Wastewater Management Plan (DWMP) and encouraged by the level of positive feedback we've received. Over the last four years, we've engaged and worked collaboratively with around 2,000 of our customers and stakeholders, to deepen our shared understanding and develop new ways to manage drainage and wastewater across our region. We illustrate our DWMP Cycle 1 and its headlines below.



We've progressed and enhanced our DWMP since we published it for public consultation in June 2022. We were pleased to receive lots of positive comments and support on the quality and ambition of our draft plan as well as useful ideas for making our final DWMP even stronger.

We've updated our draft plan based on our ongoing DWMP work, regulatory updates and our responses to the consultation feedback wherever possible*. Our updates include providing more detail where you felt it was needed and creating new appendices to answer technical queries. For more details on how we've progressed our final plan and responded to the consultation feedback, please see our [Non-technical summary](#) and [You said, We did Technical appendix](#).

* Some public consultation feedback didn't require further action or wasn't relevant to the DWMP process. Other feedback was relevant to future DWMP planning cycles and will be used to inform this work.

Progress signposts

We want to make it easy for you to see what's changed. You can spot all the places we've updated our draft plan with our 'progress signposts' which we've used across our final DWMP documents.

Progress signposts	Progress updated	More detail or new content	Number(s) updated	Delivery timeframe updated	Informing DWMP cycle 2
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Here's where they'll be:

- Preface summaries – we've put a summary table in each document's preface (excluding Summary documents and CSPs)

- Relevant chapters – we’ve placed the appropriate signposts next to each relevant chapter (including Summary document and CSPs)

To help you find our progress signposts, here are examples of what to look out for:



Progress summary table

The progress signposts summary table for the chapters in this document is outlined below. We’ve used orange cells to indicate where our draft plan has been updated with progress.

Progress signposts summary: Strategic Context					
	Progress updated	More detail or new content	Number(s) updated	Delivery timeframe updated	Informing DWMP cycle 2
2 Creating our first DWMP					

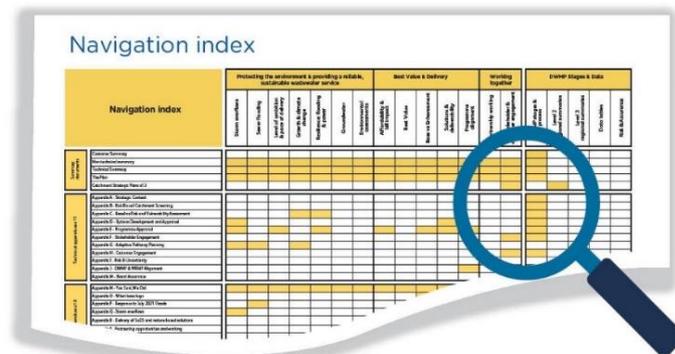
Key DWMP content

This document specifically includes the following key DWMP content:

- Best Value and Delivery:
 - Programme alignment
- DWMP stages and data:
 - DWMP stages & process

Navigating our documents

To help you navigate around our final DWMP document suite and find where key DWMP content features, we’ve placed a Navigation index at the back of this document.



A message from our CEO

Since joining Thames Water in September 2020, I've been spending time listening and engaging with our customers, colleagues, investors and stakeholders – and I'm using this information to help shape our future.

I know that our success is dependent on us all working brilliantly together. I'm passionate about understanding everyone's views, so we can build both long and short-term plans that will meet with the needs and expectations of our customers, communities and environment.

I've been struck by the dedication and enthusiasm of everyone I've met. While each group has their own interests, we all share a common goal when it comes to our business. Everyone wants Thames to successfully achieve our purpose: 'to deliver life's essential service, so our customers, communities and the environment can thrive'.

Through working closely and collaboratively with different stakeholders, I'm delighted to say we're developing our first ever Drainage and Wastewater Management Plan. This is our long-term, collaborative plan to ensure a resilient and sustainable wastewater service for the next 25 years and beyond.

I want to thank every stakeholder who has contributed to the DWMP process so far. Your involvement will continue to be fundamental for this to be a success, so we'll keep working closely together as we move forward with delivering the first years of this plan.

I'm delighted with the progress we've achieved so far, particularly the scope of work we've collaboratively defined, alongside the creation of the 12 integrated planning objectives. This work has created a strong foundation for the rest of our DWMP's development.

You may have heard me talk about the importance of us being a force for good in the communities we serve. This is something I feel strongly about. As an example of the difference we can make, I've made public my opinion that the discharge of untreated sewage into the environment is unacceptable. I want our long-term plan to support us in addressing this issue, alongside many others that will help us protect our environment for future generations. Together we can make a huge and positive impact.

I look forward to continuing to work together to deliver positive outcomes for our customers, the communities we serve and the natural environment around our special region.



Sarah Bentley

Chief Executive Officer, Thames Water

1 Introduction

Progress

No significant change between the draft and final DWMP

Introduction to the DWMP

- 1.1 It is a privilege to have responsibility for drainage and wastewater in the River Thames catchment, where we provide these services to more than 15 million people. To continue doing this effectively we must plan to address future challenges, or the service we provide may deteriorate, potentially damaging the natural environment.
- 1.2 Co-created in partnership with stakeholders, the aim of the DWMP is to identify future catchment risks to our drainage and wastewater treatment systems and develop integrated solutions to address them. Through collaboration, we'll deliver positive outcomes for our customers, communities and environment more sustainably and efficiently than we could achieve in isolation.
- 1.3 As the pressures of an ever-changing world increasingly impact what we do, it's even more important that we plan to protect and enhance our services for the future, and the DWMP process enables us to do just that. It also directly underpins the long-term strategic ambitions and priorities of our business. These have seen us invest nearly £600 million in asset resilience to improve our wastewater network since 1990, as well as achieve 99.71% compliance across our sewage treatment works in 2022. All this work helps us to prevent sewer flooding impacting our customers and pollution incidents affecting our local environment.
- 1.4 In 2020, we successfully completed this first stage of our DWMP, known as the Strategic Context stage, where we set out the principal drivers for our long-term plan. We have been encouraged by the level of stakeholder engagement we've encountered, especially considering the Covid-19 restrictions. We're always looking for ways to develop and improve our stakeholder engagement approach to make sure we're creating the most collaborative plan we can.
- 1.5 The Thames Water vision for our DWMP is in Figure 1-1.



Figure 1-1: Our DWMP Vision

2 Creating our first DWMP

Progress



2.1 This is the first time we’ve produced a long-term plan for our wastewater business. Based on the national framework that was developed jointly by regulators and industry bodies including Ofwat, Defra, the Environment Agency, Water UK, Welsh Government, Natural Resources Wales, Consumer Council for Water, ADEPT and Blueprint for Water, the DWMP is creating the roadmap for how we adapt our wastewater service to cope with future challenges.

What is a DWMP?

2.2 A DWMP is a long-term costed plan that’s focused on partnership working and sets out the future risks and pressures for our drainage and wastewater systems. It identifies the actions that are required to make sure we can continue delivering our services reliably and sustainably, while also achieving positive outcomes for our customers, communities, and environment.

2.3 In this first DWMP, we’ve prioritised the scope to focus on the future pressures we consider collectively, as an industry, to have the greatest impact on drainage and wastewater services, and that can be forecast using nationally agreed data. These are population growth and climate change

2.4 Our DWMP delivers a costed and strategic action plan of interventions, and their sequencing, for the next 25 years.

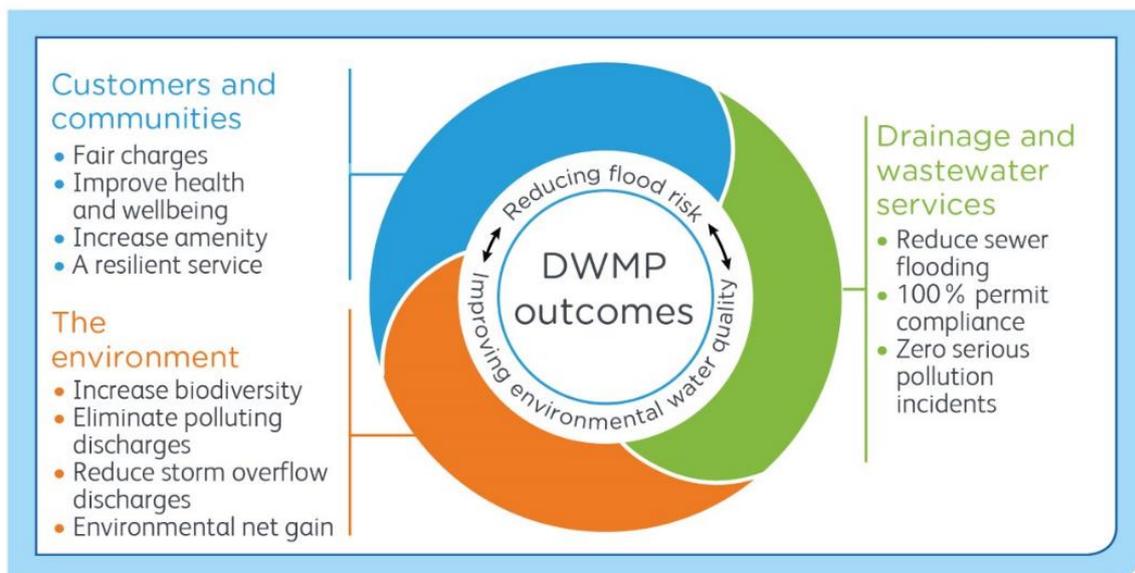


Figure 2-1: What we can achieve by working together

How does the DWMP fit with our strategy?

2.5 The DWMP planning process, and the outcomes that can be achieved by working in partnership with stakeholders, directly align with our business purpose, three long-term strategic priorities and the four pillars of our public value framework. Additionally, the outcomes of the DWMP process fully underpin our AMP7 business plan (2020 to 2025) and our developing aspirations for the 2024 Price Review. We’re carefully aligning the development of our DWMP to enable our wastewater business to support our strategic ambitions and priorities over the next 25 years.



Figure 2-2: Relationship between our corporate 2050 vision and our DWMP

How is a DWMP developed?

2.6 Our DWMP is developed using the nationally agreed framework that consists of the five-stages in Figure 2-3.

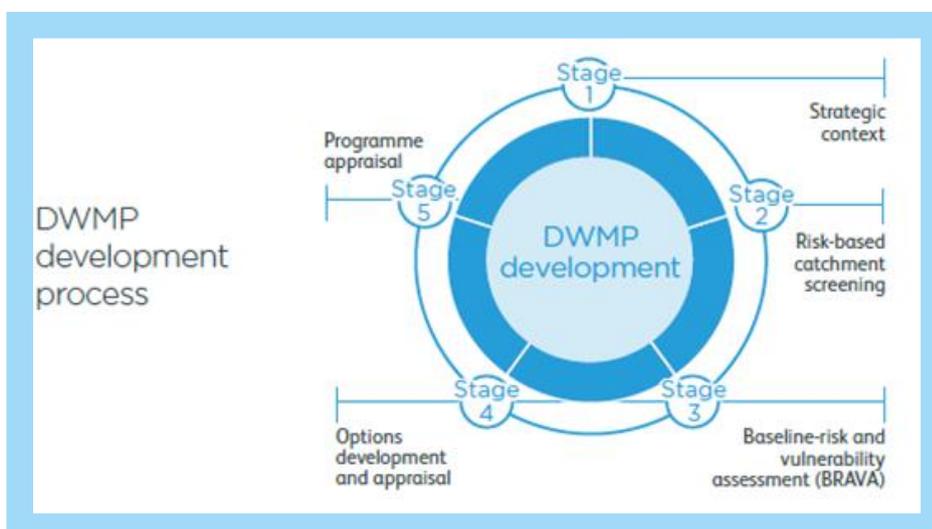


Figure 2-3: The five stages undertaken in a DWMP

How we're collaborating with stakeholders to develop our DWMP

- 2.7 It's not possible for DWMPs to be developed by water companies alone. They're led by water companies but developed collaboratively with other organisations and groups that have a shared responsibility and/or interest in drainage, flooding and environmental protection.
- 2.8 Informed by the industry-agreed framework and existing planning boundaries/groups within our region, and with the aim of developing the most comprehensive and collaborative DWMP we can, we've chosen to engage our stakeholders across three levels as outlined in Figure 2-4.

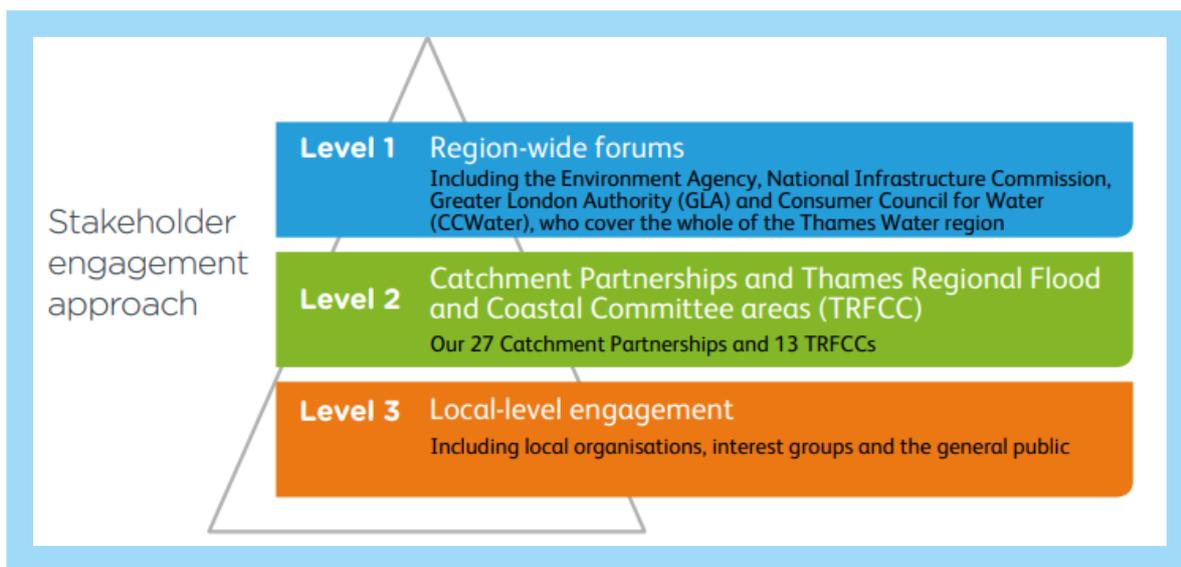


Figure 2-4: The different geographical levels in our DWMP

How the DWMP aligns with other strategic management plans

- 2.9 The DWMP is informed by, and aligned to, other strategic management plans including River Basin Management Plans and Flood Risk Management Plans. We've prioritised the alignment of our DWMP against those aspects of other strategic management plans that, through consultation with stakeholders, we consider to be critical. As the DWMP cycle matures over time, we anticipate increasing the extent of our integrated planning activity. Figure 2-4 highlights the strategic management plans and policies as well as how they relate to strategic themes.



Figure 2-5: DWMP links to other strategic management plans and policies

Our experience collaborating with stakeholders

2.10 We have extensive experience of collaborative working with drainage and wastewater stakeholders. Over the years, we've successfully delivered many major and long-term integrated plans and solutions with our stakeholders that have achieved sustainable benefits for our customers, the communities we serve and our region's environment.

2.11 For some examples of the drainage and wastewater solutions we're working on in partnership with stakeholders, see our Non-Technical Summary¹. We look forward to continuing this collaborative work as part of our DWMP going forward.

What's the Strategic Context stage?

2.12 The first step in the development of a DWMP is the Strategic Context stage. In this stage we work with our stakeholders and industry partners to agree the scope for the DWMP, the future pressures impacting its development and how we measure success.

2.13 The overriding deliverables from the Strategic Context stage are:

- An agreed scope of work for our integrated DWMP
- A set of shared planning objectives (the principal outcomes that the plan is designed to achieve)

¹ <https://www.thameswater.co.uk/media-library/home/about-us/regulation/drainage-and-wastewater/non-technical-summary.pdf>

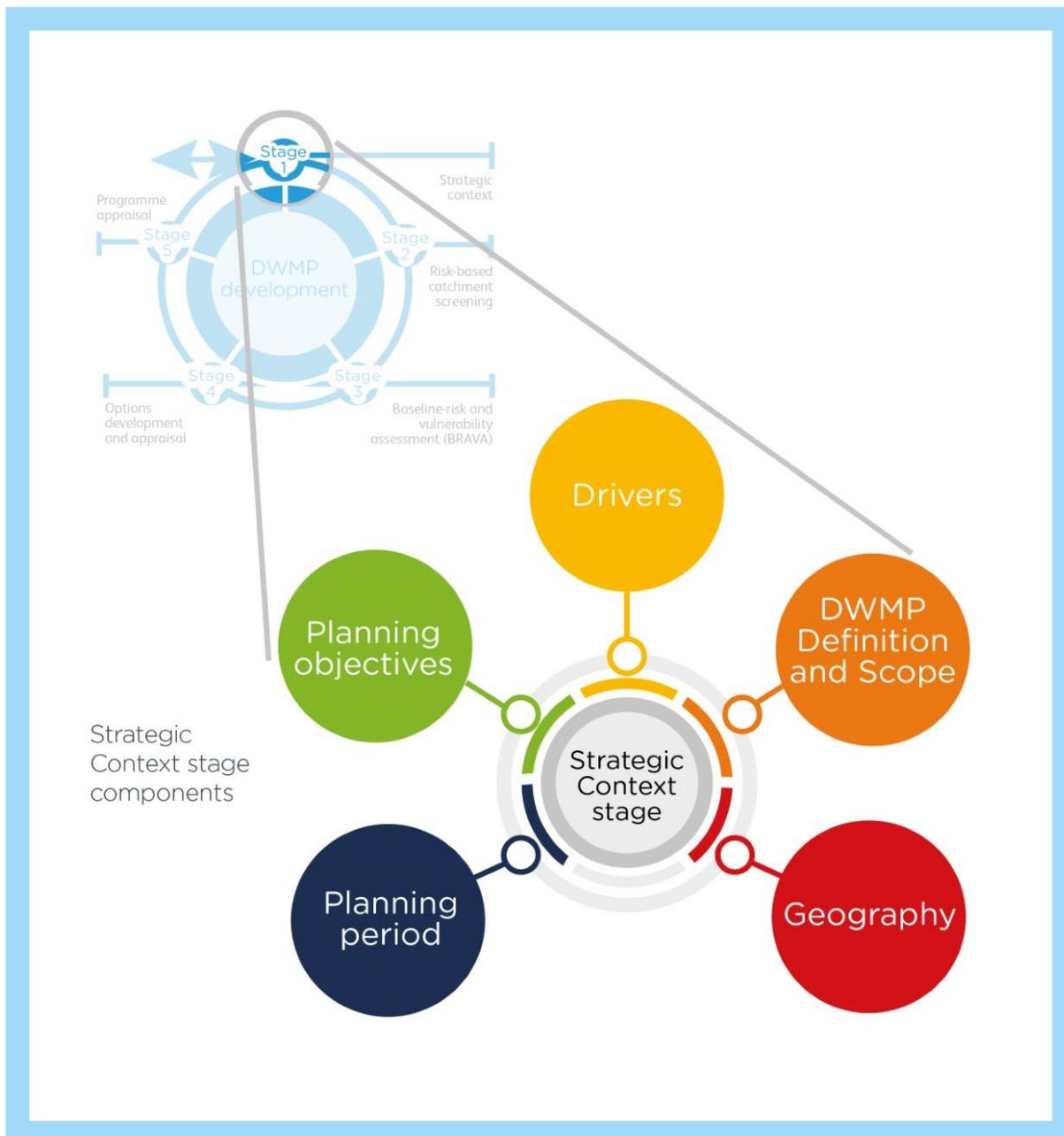


Figure 2-6: Main components of the Strategic Context stage

How we collaborated with stakeholders in the Strategic Context stage

2.14 This Strategic Context document has been developed through consultation with stakeholders from over 70 organisations, institutions, and groups. Figure 2-7 is a snapshot of our stakeholder engagement activities undertaken in this first stage of developing our DWMP.

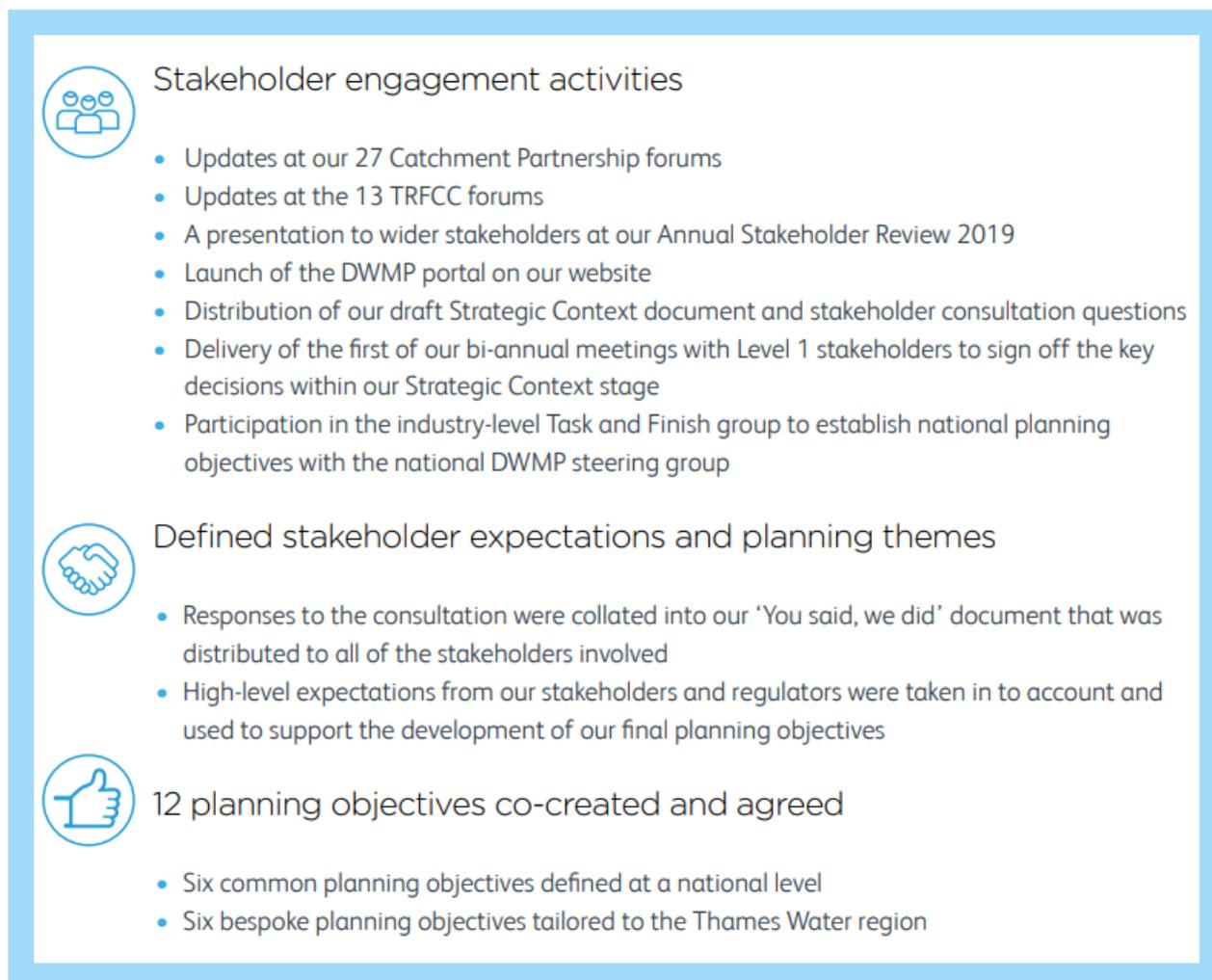


Figure 2-7: Snapshot of consultation completed for Strategic Context

3 Future pressures on our region

Progress

No significant change between the draft and final DWMP

- 3.1 After the DWMP framework was published in 2019, we initiated our Strategic Context stage with extensive research and consideration of the future challenges facing our drainage and wastewater services. Many of these are directly affecting our drainage and wastewater services now and will continue to do so in the future.
- 3.2 Here we outline the future pressures that will impact our DWMP and highlight the three that have been prioritised for this first DWMP, based on stakeholder feedback.

Climate change



- 3.3 Over the next 25 years climate change is predicted to impact the weather patterns across our region. We're expecting extreme weather events (summer heatwaves and very heavy rainfall events in winter) to become more frequent and intense.
- 3.4 Extreme changes in weather patterns create major challenges for our wastewater services, including increasing the risk of flooding, and particularly affecting the efficiency of our wastewater treatment works and drainage assets. The impact climate change may have on sewer flows, water quality, ground conditions, the sensitivity of receiving watercourses and the demand for sludge recycling potentially creates a significant future challenge for us.

Our DWMP aims to:

Address these challenges by working with our stakeholders and ecosystems to continue to deliver resilient services.

Population growth



- 3.5 Population growth and changing patterns of water usage have a huge impact on our drainage systems. We forecast the population of our wider region will grow by a further 2.3 million by 2045, supported by an extra 1.3 million new homes. In addition, the pressure on our wastewater and drainage system from a growing number of tourists and transient communities within our region needs to be taken into account.

Our DWMP aims to:

Make the most efficient use of our current capacity and look to increase capacity where necessary. Figure 3-1 outlines population demand headlines in our area.



Figure 3-1: Population demands in our region

Urban creep and misconnections



- 3.6 When green areas are paved over with impermeable materials that don't naturally drain, we call this 'urban creep'. Losing permeable surfaces within our urban areas leads to more rainwater entering our sewer network, which reduces its capacity and contributes to property flooding and poor river water quality.
- 3.7 Also often linked to urban creep is the problem of properties with surface water misconnections (i.e., downpipes from roofs) discharging into our foul sewer network. This takes up capacity within our foul network, causing overflows of untreated sewage into the environment.

Our DWMP aims to:

Reduce impermeable surfaces and identify misconnections in our region, working with partners to limit the impact of these issues on the environment and our customers' bills.

Environmental impacts

- 3.8 Protecting our environment has never been higher on social and political agendas globally. Our company, and what we do, is intimately connected to the environment – from how we abstract water from rivers, streams and aquifers to the safe processing of wastewater and efficient recycling of sludge. Increasingly stringent environmental requirements for wastewater present us with a huge challenge of balancing the need to meet them against the financial and social costs of doing so.

Our DWMP aims to:

Reduce our impact on the environment and the overall cost of meeting environmental standards to protect and enhance it for future generations.

Changing customer demands and expectations

3.9 From our experience and megatrends research conducted in 2017, we know that customer demands, behaviours, preferences and expectations of the wastewater service, and its impact on the environment, are changing. Society’s engagement in wastewater could also significantly increase in the future with some customers transitioning from consumers to ‘prosumers’, where they produce outputs from their own wastewater by reusing it rather than disposing of it.

Our DWMP aims to:

Reflect what customers want now and in the future. Figure 3-2 outlines the four scenarios we developed during the 2017 megatrend research.



Figure 3-2: Megatrends research in wastewater services

Resilient systems and asset deterioration

3.10 System resilience and adaptability is fundamental to maintain our essential service, seen most recently through the Covid-19 pandemic. The National Infrastructure Commission highlights the importance of resilient systems and how to achieve this via a proactive framework and adaptive pathways. We must follow this approach so that we can thrive despite the wide range of future pressures we face.

Our DWMP aims to:

Deliver resilient infrastructure and long-term planning using adaptive pathway approaches to provide the services our communities rely on.

Landlocking

3.11 Many of our sewage treatment works (STW) are unable to expand and increase their current capacity as the land surrounding them has been developed or is cost prohibitive to acquire. We call this ‘landlocking’, and it’s particularly a problem for us in London.

Our DWMP aims to:

Use innovation and systems thinking to optimise and intensify our existing sites, reduce the volume of wastewater that requires treatment and efficiently utilise available capacity at other STWs.

Technological advancements

3.12 Rapid advances in technology could transform how we manage wastewater and profoundly affect our long-term plans. Our key focus in this area will be increasing the monitoring and remote control of our network to give us real-time insights. We also want to develop nanotechnology to significantly improve efficiency and the removal of contaminants.

Our DWMP aims to:

Optimise potential technological advancements that support further efficiencies and opportunities for collaboration. Figure 3-3 is an illustration of adaptive pathways. These use ‘tube map’ type images to outline the different routes that can be followed to achieve an objective.

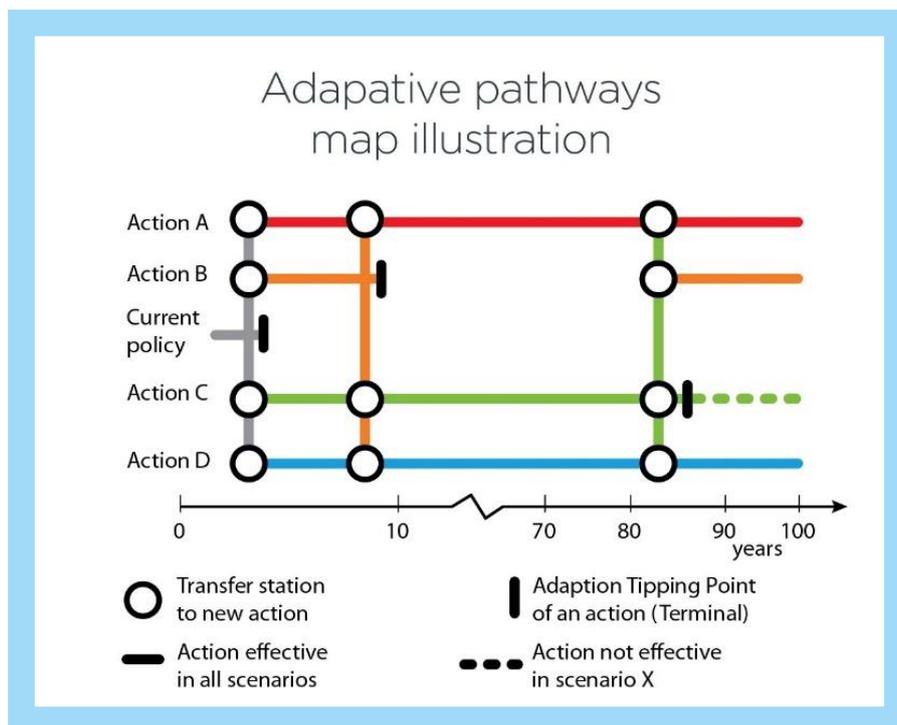


Figure 3-3: Adaptive pathway map illustration



Competition and market reform

3.13 There could be radical reform within the UK wastewater industry in the future with the expansion of competition and new markets. This would encourage opportunities, cost-efficiency and innovation in a sector that has been previously dominated by monopolies and regulation.

Our DWMP aims to:

Plan for the future of our region by closely considering and maximising potential market opportunities.

Our central role

3.14 Despite these significant pressures on the future of wastewater, we recognise our central role is to maintain a reliable and environmentally sustainable wastewater service, protect the environment on which we depend, prevent flooding from the sewer network, deliver value for money (particularly as three of the ten² most deprived Local Authorities in the UK are within our region) and support community wellbeing.

² 2021 Census - % of households deprived in at least one dimension

4 What's the scope of the DWMP?

Progress

No significant change between the draft and final DWMP

- 4.1 This first DWMP will focus on two principal future pressures: population growth and climate change. This is not to diminish the importance of the other pressures identified, but these three were recognised by our regulators and other national stakeholders as being particularly critical drivers of change. Importantly, their impacts can also be forecast into the long term.
- 4.2 Other aspects of short to medium-term wastewater planning and business as usual processes are not within the scope of this DWMP as they're considered in detail within the price review process. Figure 4-1 outlines some items that are in and out of scope for cycle 1 of the DWMP. DWMPs are iterated every five years and as the DWMP framework matures over time, in a similar way to the Water Resources Management Plan (WRMP) process, we anticipate the scope will also evolve to include broader future pressures and additional integrated stakeholder planning activities.

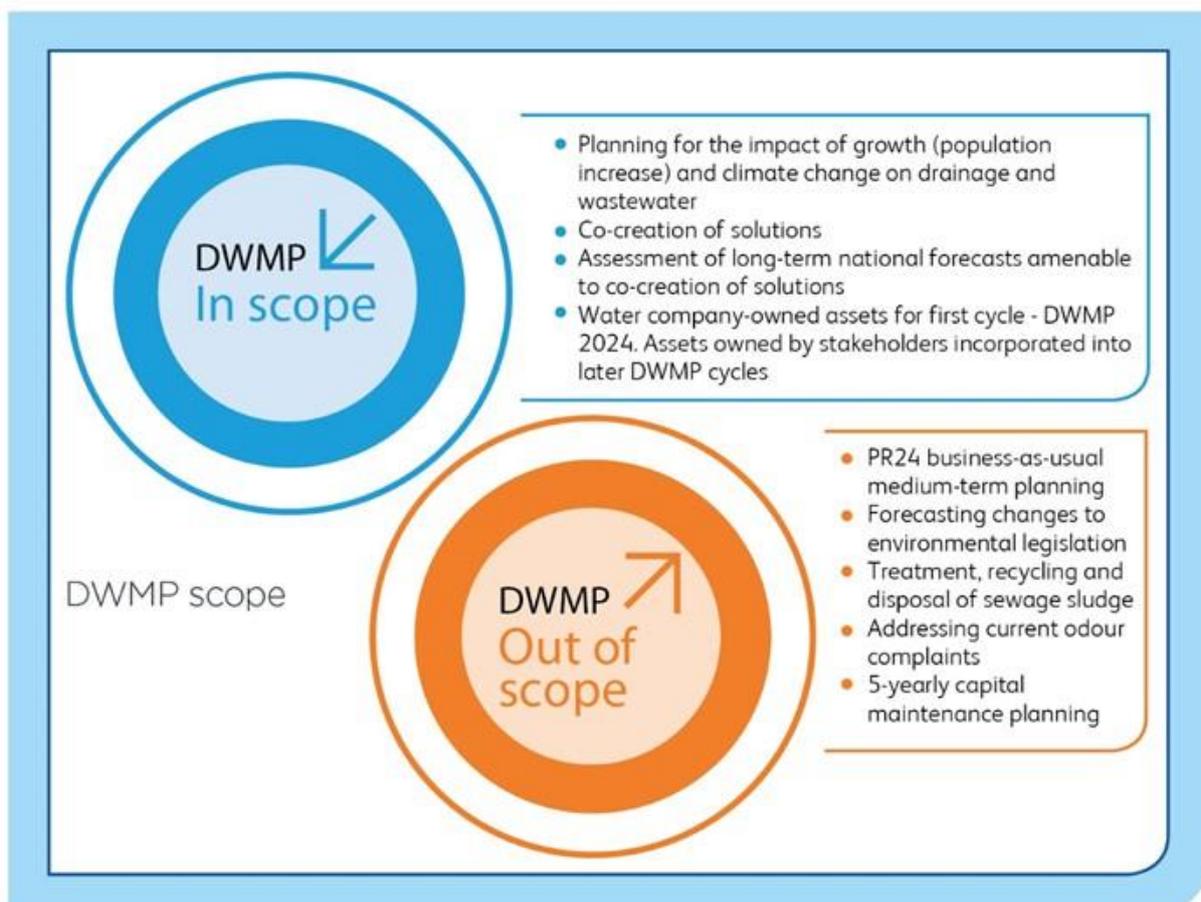


Figure 4-1: DWMP scope for cycle 1

What level of detail does the DWMP cover?

Geography

- 4.3 We work in a highly diverse region, from the densely populated commercial centre of London to the more rural, locally focused communities in the Thames Valley. Therefore, creating a DWMP that works for everyone is a difficult, but vitally important, challenge. To simplify the geography of our DWMP, we've broken it down into four levels as explained in Figure 4-2.



Figure 4-2: The four levels of geography used in our DWMP

Planning period

- 4.4 Our DWMP is based on a 25-year planning horizon up to 2050. This will help us to fully understand the future pressures affecting our region and their impacts on our service, customers, and the environment in the long term.
- 4.5 In developing the 25-year plan, we have applied three planning periods appropriate to the potential impact of each identified risk, these are represented in Figure 4-3. We therefore fully understand the progression of each risk on our region, their potential impact and investment requirement.



Figure 4-3: The three planning periods used

5 Setting shared planning objectives

Progress

No significant change between the draft and final DWMP

What's a planning objective?

5.1 A planning objective represents a measurable goal for our DWMP. As the DWMP is focused on long term planning at both national and local levels, the planning objectives take two forms:

- Common planning objectives (applied to all companies and reported at a national level)
- Bespoke planning objectives (specific to our company and regional priorities, developed with local stakeholder consultation and reported at a local level)

5.2 As our starting point for creating shared planning objectives, we followed the DWMP framework. This stated that planning objectives should reflect the performance commitments defined in previous price reviews that provide a significant contribution to the achievement of drainage and wastewater outcomes. We took our five most relevant performance commitments, and their associated themes, and used them as the basis for developing the DWMP objectives. The high-level themes and measures we selected are outlined in Figure 5-1:

Theme	Measure
Environment	Pollution incidents
	Sewage treatment works compliance
Property flooding	Internal flooding
Resilience	Risk of sewer flooding in a storm
Asset health	Sewer collapses

Figure 5-1: The high-level draft planning objectives' themes and measures.

Collaborating with stakeholders to co-create planning objectives

5.3 Our next step was to seek stakeholder views on our draft Strategic Context document, including the draft planning objectives, and to discuss how we could work together to develop shared planning objectives and the DWMP for our region.

5.4 In autumn 2019, we sent our draft Strategic Context document, including the five consultation questions detailed in Figure 5-2, to a cross section of Level 2 stakeholders, requesting their views. Our aim was to consult with our Level 2 stakeholders (the 13 sub-committees of the TRFCC and our Catchment Partnerships) to get a region-wide view.

Question 1	Are there any other drivers that need to be considered in DWMP24?
Question 2	Do you think Thames Water's five planning objectives are appropriate for DWMP24?
Question 3	Are there key projects in your area that should be part of DWMP planning?
Question 4	Are there any key data sets in your organisation, that you can share, that would enhance DWMP planning?
Question 5	In addition to our L2 forums, are we missing any other valuable stakeholder engagement opportunities?

Figure 5-2: Consultation questions for the Strategic Context stage

5.5 Our consultation period ran from autumn 2019 to end of January 2020. In this time, we received stakeholder comments from across our region that have helped to:

- Inform our approach to the development of our DWMP.
- Initiate vital conversations on the sharing of useful datasets.
- Refine our integrated planning objectives.

5.6 We also followed-up directly with stakeholders in those regions that didn't respond to our consultation.

Summary of stakeholder responses to consultation questions

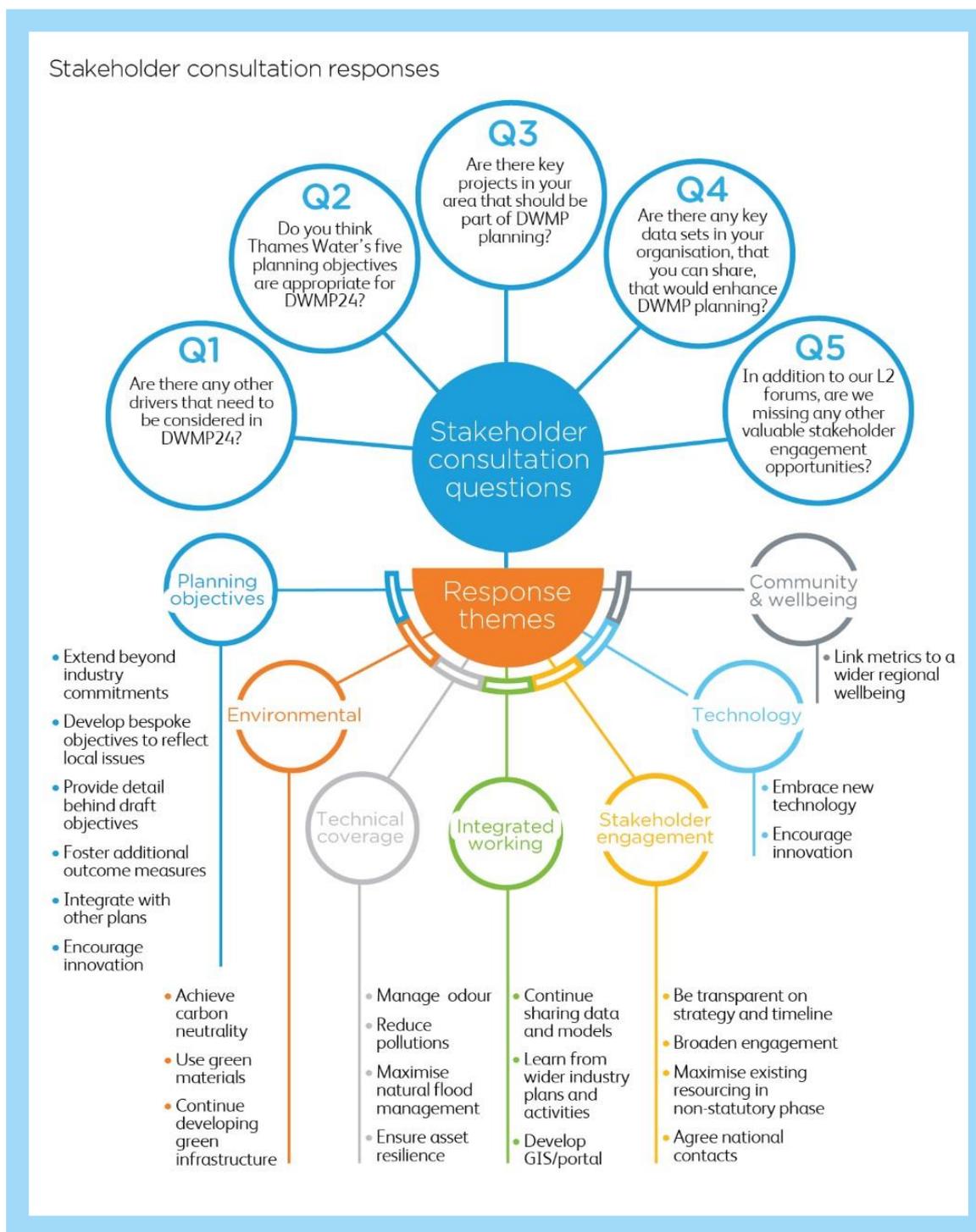


Figure 5-3: Stakeholder consultation responses³

³ Stakeholder respondents: London Borough of Barking and Dagenham, London Borough of Haringey, London Borough of Hillingdon, London Borough of Lambeth London Borough of Richmond and Wandsworth, London Borough of Southwark, Surrey County Council, Vision Redbridge Cultural and Leisure, Wiltshire Council, Wokingham Borough Council, EA - Hertfordshire and North London and Thames, South Central London TRFCC Partnership, Buckingham County Council, Greater London Authority ('GLA'), North West London TRFCC, Partnership, EA - Kent and South, FWAG SouthWest (Gloucestershire team), Redbridge (Vision RCL), NWL partnership, Crane Valley Partnership and South East Rivers Trust (SERT)

Sample stakeholder responses

- 5.7 We greatly appreciated the stakeholder responses we received throughout the consultation period. They were detailed and covered a broad range of different issues, some of which we're unable to forecast against in this first DWMP cycle.
- 5.8 However, all the stakeholder responses will inform our plans and where the response was outside of the DWMP, or our remit, we've shared it with the appropriate organisation(s). Figure 5-3 illustrates a sample of the stakeholder consultation responses we received.



Figure 5-4: Sample stakeholder comments

What our stakeholders expect in our DWMP

- 5.9 Overall, the consultation responses told us that our stakeholders wanted a much broader range of planning objectives to be incorporated into our DWMP and measurable benefits. Our stakeholders expect our plan to cover wider environmental issues such as carbon, and broader community impacts, including evaluating wellbeing.

What our regulators expect in our DWMP

- 5.10 We also consulted at a national level with our regulators. Through these discussions we know they expect our shared planning objectives to address a balance of environmental and flooding challenges. To achieve this, we've developed a planning objective specifically focused on storm overflow performance. Now that the government has published its Storm Overflow Reduction Plan, we can be confident that our selected planning objective also aligns with political and regulatory expectations.

6 Translating stakeholder feedback into shared planning objectives

Progress

No significant change between the draft and final DWMP

- 6.1 Informed by our stakeholder consultation responses and expectations, we developed the following categories for our final DWMP planning objectives:
- Six common objectives agreed with national DWMP stakeholders through an industry-level Task and Finish group – identified in green
 - Two bespoke objectives amenable to long-term forecasting and modelling – identified in blue
 - Four bespoke objectives not currently amenable to long-term forecasting and modelling, and therefore considered as ‘outcome measures’ – identified in shaded orange
- 6.2 In summer 2020, we agreed our DWMP’s final planning objectives with our regulators and wider stakeholders, as outlined in the table to the right.
- 6.3 As part of our five-year business planning cycle, we’ll continue to develop and refine our list of planning objectives with input from our stakeholders. This will make sure our integrated priorities and investments align, and we’re delivering the required outcomes for the customers and communities we serve and the special environment in which we operate.

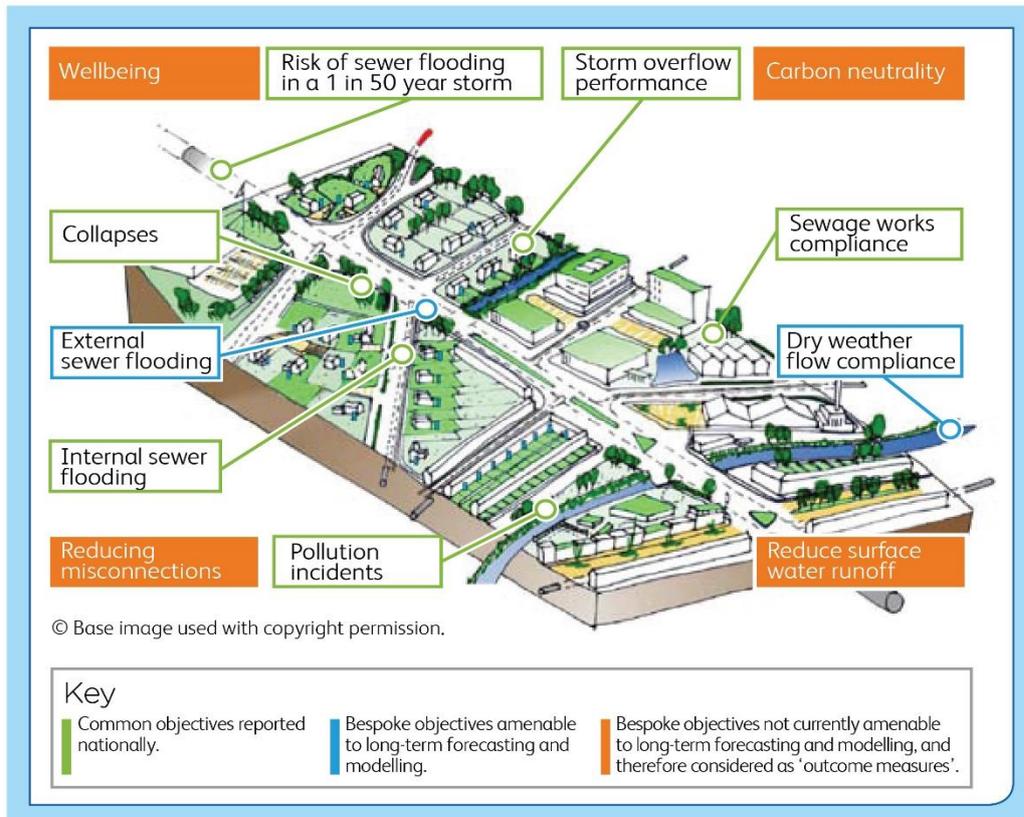


Figure 6-1: Agreed planning objective for Cycle 1 of the DWMP

Theme	Planning objective	How we measure this objective	What we're trying to achieve
Environment 	Sewage treatment works quality compliance To define the ability of STW to treat and dispose of sewage in line with the current discharge permit quality conditions.	Modelled sewage treatment works compliance against current permit quality conditions.	Protection of our environment, looking after the health of our communities, rivers and aiming for zero pollution incidents
	Sewage treatment works flow compliance To define the ability of STW to treat and dispose of sewage in line with the current discharge permit dry weather flow (DWF) conditions.	Modelled compliance against daily DWF permit limit.	
	Risk of pollution incidents To define the risk of polluting discharges to the environment (classified as Category 1 to 3 by the Environment Agency) arising from either network or treatment sites.	An average of the last three years of annual performance for Category 1 to 3 pollution incidents as set out in Environmental Performance Assessment (EPA).	
	Storm overflow performance To define the ability of the sewerage system (including STW) to operate in storm conditions with an acceptable frequency of overflow to the environment.	Modelled annual average frequency of discharge (number of events) from storm overflows using forecast rainfall data.	
	Carbon To achieve net zero carbon by 2030 for our business and to support our stakeholders' carbon neutrality goals.	The carbon impact of interventions has been quantified using the carbon models present within our engineering estimation systems (identifying carbon dioxide equivalents (tCO ₂ e)).	
	Wellbeing To provide beneficial impacts on population and human health.	Scored based on the baseline environmental factors that influence population and human health, and the impacts of the solution option(s) selected to meet the performance targets.	
Property flooding 	Internal sewer flooding risk To define the risk of properties flooding internally from our sewers.	Two metrics: 1. Risk assessed based on average of last three years performance data 2. Modelled risk based on internal escape locations in a 1 in 30-year rainfall event.	Development of our wastewater system to deliver a reliable and efficient service and to be resilient to the risks of flooding
	External sewer flooding risk To define the risk to outside areas within a boundary curtilage flooding from our sewers.	Modelled risk based on external escape locations in a 1 in 30-year rainfall event.	
	% of population at risk of sewer flooding in a 1 in 50-year storm To define the percentage of our region's population at risk of sewer flooding from a 1 in 50-year storm, equating to a 2% probability of the storm event occurring in any given year.	Percentage of population at risk of flooding in a 1 in 50-year storm event.	
	Reduce surface water runoff To reduce the volume and/or flowrate of surface water run-off into our combined and surface water sewer networks, to levels equivalent to runoff from greenfield areas.	Modelled based on measurement of the extent of surface water runoff removed/ reduced.	
	Reduce misconnections To reduce the number of misconnections of surface water entering our foul sewer network, or vice-versa.	Foul misconnection to surface water networks: Assessed to consider whether they will offer benefit or not to reducing misconnections. Surface water misconnections to foul networks: modelled based on measurement of the extent of surface water runoff removed/ reduced.	
Asset Health 	Sewer collapses To define the risk of a sewer collapsing so that its ability to convey wastewater is compromised, specifically defined as the number of sewer collapses.	An average of the last three years of annual performance.	

Figure 6-2: Summary of the planning objectives and metrics

7 Our next steps

Progress No significant change between the draft and final DWMP

- 7.1 Four further stages were undertaken as part of the national framework. We continued to engage our stakeholders throughout these stages, with Stage 4 of the DWMP process, the ‘Optioneering’ stage, being the most intensive stage for stakeholder collaboration. More information about each of the DWMP stages can be found in the relevant technical appendices. A summary of the stages, deliverables, timeline, and engagement is in Figure 7-1.
- 7.2 Due to the Covid-19 pandemic, we had to adapt our approach to stakeholder engagement throughout each stage of engagement so that we could co-created a DWMP that positively shapes the future of wastewater in our region.

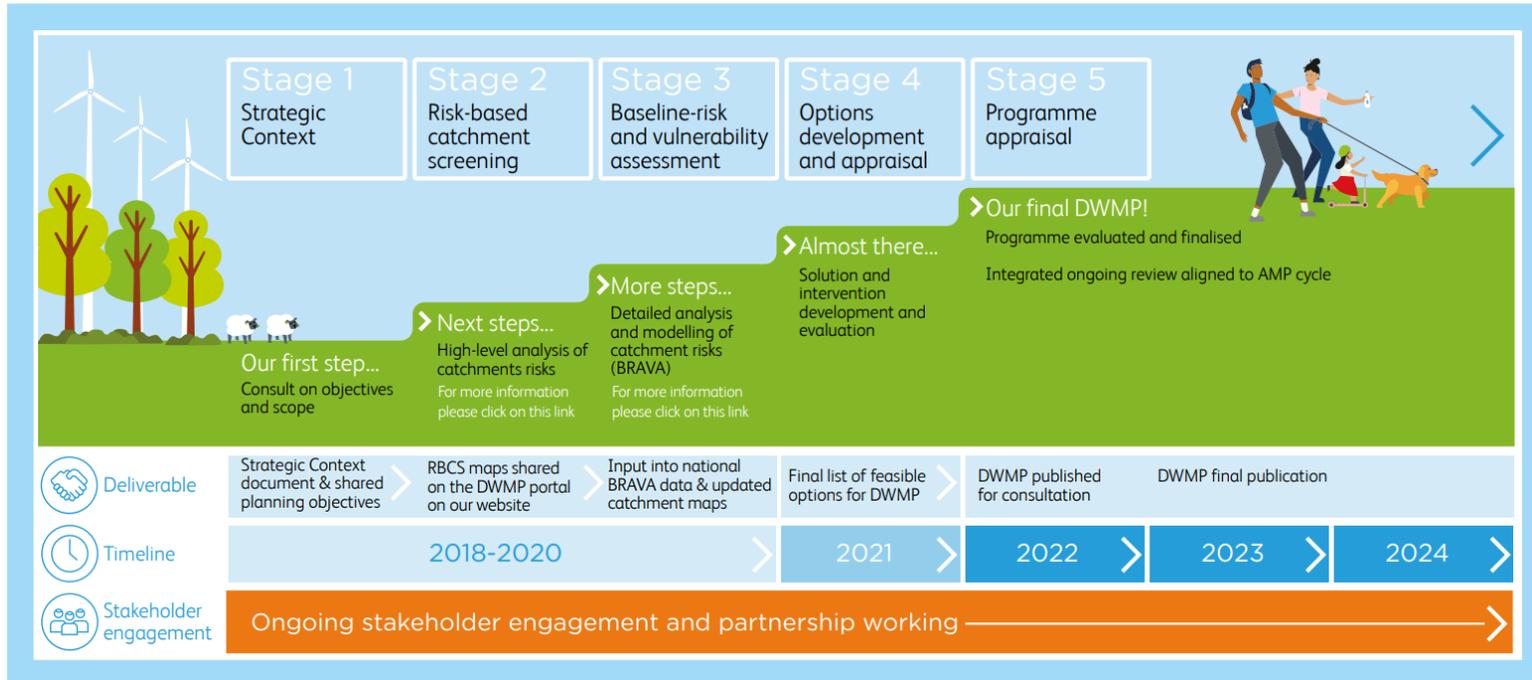


Figure 7-1: Stakeholder engagement through the steps within our DWMP

8 Work with us

- 8.1 We want to continue to draw on your expertise and knowledge and invite you to work further with us to meet the future needs of drainage and wastewater services in our region.
- 8.2 Please get in touch with us by emailing our DWMP team at DWMP@thameswater.co.uk
- 8.3 For more information on our DWMP work, or to share your views, please visit the DWMP portal on our website⁴.

References

- 8.4 The key reference sources and publications that have informed this document are:
- Working together to improve drainage and environmental water quality. An overview of Drainage and Wastewater Management Plan, 2019. Commissioned by Water UK in collaboration with Defra, Welsh Government, Ofwat, Environment Agency, Natural Resources Wales, Consumer Council for Water, ADEPT and Blueprint for Water⁵.
 - Water UK DWMP webpage⁶.
 - London 2100: The case for change. Sets out the future challenges that require our planning of wastewater services to change. Thames Water, 2017. ⁷
 - ANTICIPATE, REACT, RECOVER - Resilient infrastructure systems, The National Infrastructure Commission, 2020⁸.
 - Dynamic adaptive policy pathways: A method for crafting robust decisions for a deeply uncertain world. Marjolijn Haasnoot, Jan H.Kwakkel, Warren E.Walker, Judith ter Maatd, Volume 23, Issue 2, 2013⁹.
 - BRAVA planning objectives for the first cycle of DWMPs, Water UK, 2020¹⁰.
 - Planning objectives image used with copyright permission. © Figure 6-1 base image from Retrofitting to manage surface water, Digman, C, Ashley, R, Balmforth, D, Balmforth, D, Stovin V, Glerum, J, CIRIA, 2012¹¹.

⁴ <https://www.thameswater.co.uk/about-us/regulation/drainage-and-wastewater-management>

⁵ <https://www.water.org.uk/wp-content/uploads/2019/09/Working-together-to-improve-drainage-and-environmental-water-quality-an-overview-of-Drainage-and-Wastewater-Management-Plans.pdf>

⁶ <https://www.water.org.uk/policy-topics/managing-sewage-and-drainage/drainage-and-wastewater-management-plans/>

⁷ <https://www.thameswater.co.uk/media-library/home/about-us/london-2100-a-case-for-change.pdf>

⁸ <https://nic.org.uk/app/uploads/Anticipate-React-Recover-28-May-2020.pdf>

⁹ <https://www.sciencedirect.com/science/article/pii/S095937801200146X>

¹⁰ <https://www.water.org.uk/wp-content/uploads/2020/07/BRAVA-planning-objectives-for-the-first-cycle-of-DWMPs.pdf>

¹¹

[https://www.ciria.org/ItemDetail?iProductcode=C713&Category=BOOK#:~:text=Retrofitting%20to%20manage%20surface%20water%20\(C713\)&text=As%20urban%20areas%20develop%2C%20natural,benefits%20of%20natural%20drainage%20processes](https://www.ciria.org/ItemDetail?iProductcode=C713&Category=BOOK#:~:text=Retrofitting%20to%20manage%20surface%20water%20(C713)&text=As%20urban%20areas%20develop%2C%20natural,benefits%20of%20natural%20drainage%20processes)

Glossary

Term	Description
1 in 30-year storm	A storm that has a 1 in 30 chance (3.33% probability) of being equalled or exceeded in any given year. This does not mean that a 30-year flood will happen regularly every 30 years, or only once in 30 years.
1 in 50-year storm	A storm that has a 1 in 50 chance (2% probability) of being equalled or exceeded in any given year. This does not mean that a 50-year flood will happen regularly every 50 years, or only once in 50 years.
Asset Management Plan (AMP)	A five-year planning cycle used by English and Welsh water industry regulators to set allowable price increases for privately owned water companies and for the assessment of performance indicators such as water quality and customer service.
Baseline Risk And Vulnerability Assessment (BRAVA)	Following Risk Based Catchment Screening (RBCS), more detailed risk assessments on those catchments where we believed there was an adverse risk to performance over time. We modelled their performance to 2020 (baseline), 2030, 2035 and 2050.
Business Plan	Business Plans are produced by water companies every 5 years. They set out their investment programme to ensure delivery of water and wastewater services to customers. These plans are drawn up through consultation with the regulators, stakeholders and customers and submitted to Ofwat for detailed scrutiny and review.
Catchment Strategic Plans (CSPs)	Summary reports to promote system thinking across large wastewater catchments. These provide early sight of our final plans enabling co-authoring opportunities for our stakeholders. Each document outlines the challenges that the catchment will face in the future and the long-term plans to address these issues.
Combined sewer	A sewer designed to receive both wastewater and surface water from domestic and industrial sources to a treatment works in a single pipe.
Customer Challenge Group (CCG)	An independent body that challenges both our current performance and our engagement with customers on building our future plans.
Cycle 1 and Cycle 2 DWMP	Our current DWMP is referred to as Cycle 1, it covers a planning period of 2025-2050. Our next plan will be published in five years' time and is referred to as our Cycle 2 DWMP, it will cover a planning period of 2030-2055.
Department for Environment, Food and Rural Affairs (Defra)	UK government department responsible for safeguarding the natural environment, food and farming industry, and the rural economy.
Drainage and Wastewater Management Plan (DWMP)	A Drainage and Wastewater Management Plan (DWMP) is 'a long-term strategic plan that sets out how wastewater systems, and the drainage networks that impact them, are to be extended, improved and maintained to ensure they are robust and resilient to future pressures'. The planning period is 25 years, from 2025 to 2050. DWMP is iterated every five years; the first known as 'Cycle 1', published as a final plan in May 2023.
dDWMP	The draft version of the Drainage and Wastewater Management Plan, published in June 2022 ¹² .
fDWMP	The final version of the Drainage and Wastewater Management Plan, to be published in May 2023.
Dry Weather Flow (DWF)	Dry Weather Flow is the average daily flow to a Sewage Treatment Works (STW) during a period without rain.

¹² <https://www.thameswater.co.uk/about-us/regulation/drainage-and-wastewater-management>

Environment Agency (EA)	UK government agency whose principal aim is to protect and enhance the environment in England and Wales.
EA Pollution Categories 1 to 3	<p>Category 1 incidents have a serious, extensive or persistent impact on the environment, people or property.</p> <p>Category 2 incidents have a lesser, yet significant, impact.</p> <p>Category 3 incidents have a minor or minimal impact on the environment, people or property with only a limited or localised effect on water quality.</p> <p>Further Ofwat guidance available here: WatCoPerfEPAMethodology v3-Nov-2017-Final.pdf (ofwat.gov.uk)</p>
Event Duration Monitoring (EDM)	Event duration monitoring (EDM) measures the frequency and duration of storm discharges to the environment from storm overflows.
External hydraulic sewer flooding	<p>External flooding occurs within the curtilage of a property due to hydraulic sewer overload.</p> <p>Further Ofwat guidance available here: Reporting-guidance-sewer-flooding.pdf (ofwat.gov.uk)</p>
Foul sewer	A foul sewer is designed to carry domestic or commercial wastewater to a sewage works for treatment. Typically, it takes wastewater from sources including toilets, baths, showers, kitchen sinks, washing machines and dishwashers from residential and commercial premises.
Grey infrastructure	New sewers, sewer upsizing and attenuation storage to provide additional capacity in the wastewater networks. Also covers new pumping stations, rising mains and/or civil structures at STWs.
Green infrastructure	Sustainable surface water management solutions, including sustainable drainage systems (SuDS), that are designed to mimic naturally draining surfaces. Typically applied to surface water or combined sewerage systems, but can also be applied to land, highway or other forms of surface drainage.
Historic England (HE)	A non-departmental public body of the government whose aim is to protect the historical environment of England by preserving and listing historic buildings, ancient monuments.
Hydraulic overload	Hydraulic overload occurs when a sewer or sewerage system is unable to cope with the receiving flow.
Internal hydraulic sewer flooding	<p>Flooding which enters a building or passes below a suspended floor caused by flow from a sewer.</p> <p>Further Ofwat guidance available here: Reporting-guidance-sewer-flooding.pdf (ofwat.gov.uk)</p>
L2 Area (Strategic Planning Area)	An aggregation of level 3 catchments (tactical planning units) into larger level 2 strategic planning areas. The level 2 strategic planning areas allow us to describe strategic drivers for change (relevant at the level 2 strategic planning area scale) as well as facilitating a more strategic level of planning above the detailed catchment assessments.
L3 Catchment (Tactical Planning Unit)	Geographical area in which a wastewater network drains to a single STW. Stakeholders may be specifically associated with this area. Includes for surface water sewerage that may exist which serves the wastewater geographical area but drains to a water course.
Lead Local Flood Authorities (LLFAs)	LLFAs are Risk Management Authorities as defined by the Flood and Water Management Act 2010. They have statutory duties with respect to flood risk management, investigating flooding and the compilation of surface water management plans.

Long-Term Delivery Strategy (LTDS)	A requirement by Ofwat on water companies, to ensure that short term expenditure meets long term objectives for customers, communities, and the environment. These will be submitted as part of the Price Review.
Misconnections	Misconnections are where either surface water drainage or foul water is connected to the wrong system e.g., surface water to foul only or foul to surface water systems.
Natural capital accounting	The process of calculating the total stocks and flows of natural resources in a given system, either in terms of monetary value or in physical terms.
Natural England (NE)	A non-departmental public body sponsored by the Department for Environment, Food and Rural Affairs to protect the natural environment in England, helping to protect England's nature and landscapes.
Non-governmental organisation (NGO)	An organisation that operates independently of any government, typically one whose purpose is to address a social or political issue.
Options Development and Appraisal (ODA)	A method to focus the level of planning effort, i.e., proportionate to the risks identified, with a view to providing a measure of consistency across the industry.
Ofwat	The regulatory body responsible for economic regulation of the privatised water and wastewater industry in England and Wales.
PR24	<p>Every five years, water companies set out their plans for what they'll deliver and how much they'll charge customers¹³. Their plans over the next five years should include how they will:</p> <ul style="list-style-type: none"> • Provide a safe and clean water supply • Provide efficient sewerage pumping and treatment services • Control leaks • Install meters • Maintain pipes and sewers • Maintain and improve environmental standards <p>This process is known as the price review, and the next one will be in 2024, when Ofwat will make its final decisions. We call this PR24.</p>
Risk-Based Catchments Screening (RBCS)	A first-pass screening exercise of catchment vulnerability against 17 different risk indicators. To understand which catchments are low risk catchments and those that are likely to be at risk in the future if not supported by our long-term plan.
Risk Management Authorities (RMAs)	Authorities responsible for Flood Risk as defined in the Flood and Water Management Act 2010. These include, Lead Local Flood Authorities, Highway Authorities, Local Planning Authorities, Natural England and the Environment Agency.
Sewage Treatment Works (STW)	A sewage treatment works receives and treats wastewater to a standard legally agreed with the Environment Agency, before it is released back into the environment.
Specific, Measurable, Achievable, Relevant, and Time-Bound (SMART)	A framework for setting effective targets.
Storm overflow discharges	Storm overflows are used to manage excess flows, which typically occur as a result of heavy rainfall. Excess flow that may otherwise have caused flooding is released through a designated outfall to a water course, land area or alternative drainage system.

¹³ <https://www.ccwater.org.uk/priorities/price-review/>



Strategic Environmental Assessment (SEA)	A systematic decision support process to ensure that environmental and other sustainability aspects are considered effectively in policy, plan and programme making.
Surface water sewer	A surface water sewer collects rainwater from domestic and commercial roofs, driveways, patios etc to a local watercourse or suitable surface water drainage system.
Sustainable Drainage systems (SuDS)	Drainage solutions that provide an alternative to the direct channelling of surface water through networks of pipes and sewers to nearby watercourses. SuDS aim to reduce surface water flooding, improve water quality, and enhance the amenity and biodiversity value of the environment. SuDS achieve this by lowering flow rates, increasing water storage capacity and reducing the transport of pollution to the water environment.
Thames Regional Flood and Coastal Committee (TRFCC) area	The TRFCC area was established by the Environment Agency under the Flood and Water Management Act 2010 that brings together members representing the Constituent Authority. Featured TRFCCs are listed here on our DWMP portal: Drainage and Wastewater Management Plan (arcgis.com)
Water Industry National Environmental Programme (WINEP)	The framework under which Defra and the EA require environmental improvements to be delivered by water companies. Guidance is released by regulators, which water companies interpret for their geographical area, and resubmit the outputs back to regulators for endorsement.

We welcome your views on our DWMP. Please share them with us by emailing:
DWMP@thameswater.co.uk .

This document reflects our DWMP 2025-2050 as published in May 2023.

