DRAINAGE & WASTEWATER MANAGEMENT PLAN

Dŵr Cymru Welsh Water
Drainage and Wastewater Management Plan 2024 – Non-Technical Summary

Draft – July 2022

IN PARTNERSHIP WITH

rps ATKINS Member of the SNC-Lavalin Group wsp

PREFACE

We have completed our first DWMP. This Draft DWMP is being published as a consultation. We welcome your comments on what we have produced and your opinion on how we intend to prepare future DWMP's. We are particularly interested in your thoughts with regards to our approach to customer and environmental priorities and how those priorities are to be used in the production of future plans.

This plan is different to other plans we prepare as it tries to answer, not only how to remain compliant with our operating licence, but also tries to prepare the company for the future challenges in society.

One of these is the legacy of combined sewers, which are reliant on storm overflows to prevent localised customer flooding. We need to transition to separate foul and surface water sewers to reduce the need for storm overflows where possible, whilst maintaining our performance. The environmental benefit of achieving this separation over time is to reduce nutrients such as phosphates and nitrates which we as customers use entering the water courses. This is a major driver going forward to achieve high standards in our rivers and oceans to meet the water framework directive.

We need to set out the complexity of the drainage issues across our operating area. Our combined sewers often accept inflows of surface water from roads, car parks, building roofs and even land drainage, which we do not own or control. We need to work closely with other stakeholders, and need their ongoing support, to gather the evidence and deliver the right long-term solutions to these challenges.

Our DWMP shows that the costs of making this transition will be significant. The DWMP provides an evidence base to begin discussion with Welsh Government and our regulators on the pace of change that they expect to see. It goes beyond the current focus on storm overflows, influencing long-term integrated drainage priorities for Wales and the border areas of England within which we operate.

We recognise that stakeholders are looking towards us to re-address storm overflows and minimise their use. Our preferred approach considers how to make widespread improvements at an affordable rate for our customers. We have estimated that to remove storm overflows and customer flooding would cost between £9 billion and £27 billion. This quantum, when considered as a bill increase, is not tenable and unlikely to be acceptable to our customers. Ultimately, the pace of the improvements we can make will be heavily dictated by the scale of water and sewerage bills that our customers can afford to pay.

As part of developing our first DWMP we have followed the national DWMP Framework but have also developed our own innovative approaches to planning, which allow choices to be made in terms of what needs to be achieved in the short term, and then creating a pathway for each local area to maintain progress to that destination.

It builds on principles developed by all companies for water and sewerage planning to gain a holistic catchment approach to finding risks, developing options to resolve those risks, and providing an indicative timeline of when that risk may materialise and when the solution will need to be resolved.

The Plan and the regional summaries lay out the types of risks that we are facing, the strategic option types that are needed in each location to address those risks and a high-level cost to get to improved performance in our wastewater systems.

This is a consultation to discuss the approach we have taken, the pace of change that is realistic and how we can integrate our approach with other stakeholders to deliver the best solutions for customers and the environment. We have identified several different investment scenarios to get us to our long-term destination in systematic affordable steps. We would like your opinion on which approach to take for our next cycle. The plan and the regional summaries, which support it, lay out the types of risks that we are facing, the strategic option types that are needed in each location to address those risks and a high-level cost to get to a future improvement.

Alongside the Plan, we have also undertaken a Strategic Environmental Assessment (SEA) and Habitats Regulations Assessment (HRA) of the options developed so far. These documents are also being published for consultation.

All three consultations will be assessed as one consultation via the main consultation forum of the virtual room.

The consultation is a significant milestone in considering how we should deal with long term sewerage and drainage planning and we welcome your views and comments.

The consultation will run for 10 weeks, starting on 27th July 2022 and closing at Midnight on 7th of October 2022.

Please respond to the consultation using one of the routes below.

- Using the virtual room and consultation feedback questionnaire
- Via an email to our mailbox at the DWMP@dwrcymru.com
- And finally, via a printed response to our head office

Mr Steve Wilson
Dŵr Cymru Welsh Water
DWMP Consultation
Linea
Fortran Road
St Mellons
Cardiff
CF3 0LT

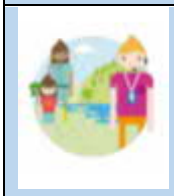
We would recommend the virtual room as the simplest route to viewing the consultation material.

INTRODUCTION

What is a DWMP?

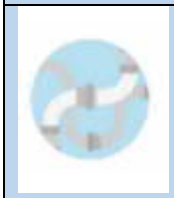
The Drainage and Wastewater Management Plan (DWMP) is a long-term planning study which looks at drainage and sewerage needs over the next 25 years. The Plan looks at future trends and embeds an approach of working together with others to investigate and identify options for the sustainable management of our wastewater services.

This is a customer driven plan that will set out how we intend to manage future challenges brought about by population growth, urban creep and climate change



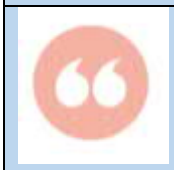
It will set out how we intend to extend, improve and maintain drainage and wastewater systems across Wales and the areas of England that we serve.

It plans for the Long-term, setting out targets that are appropriate to the risks we face, but for a minimum period of 25 years that covers both England and Wales.



It is a best practice approach- built on processes already established such as Water Resources Management Plans and Sustainable Drainage Plans.

It demonstrates greater transparency, robustness and line of sight to investment decisions that affect our customers.



Developing this plan will help us work towards our Welsh Water 2050 vision to “earn the trust of our customers every day” and to achieve our mission of becoming “a truly world-class, resilient and sustainable service for the benefit of future generations”.

Above: Infographic explaining what a DWMP is.

The DWMP is a joint exercise between the Welsh and UK Governments, water companies, regulators, and other organisations. It is focused on our customers and our environment, considering how we will respond to future challenges. The Plan sets out how we will extend, improve, and maintain our drainage and wastewater systems to meet government and customer requirements.

The Plan assesses the level of risk we face from climate change, urban development, and a changing population. It looks 25 years into the future, as a minimum, with the current Plan covering how we will deal with the challenges that we expect to arise between 2025 to 2050. It also reviews how we can respond to some of the most significant challenges over an even longer period.

It is our intention that the planning process for the DWMP will be updated every 5 years, with progress reviews taking place every year. Whilst we will be presenting our progress on this Plan, we will also be feeding into the development of the next plan at the same time.

During the current period of consultation, we will be presenting the results of our current findings and making recommendations on how we can make improvements for the next Plan.

This is the first time that a DWMP has been created. It is one of the most complex plans that Welsh Water has ever produced. As a result, the Plan contains a lot of detailed and technical information. We have created this document to give you a shorter overview of the main Plan.

Why is the plan important?

You may be asking yourself how this may affect you. The answer is that we all need effective sewerage and drainage to protect our health, homes, communities, and businesses – it's a vital part of everyday life.

The decisions we make today will have an impact for many years to come. We want to know what you think we should do.

Changes in future will increase the risk of flooding. These changes include:

- Climate change
- A changing population
- Increased demand for clean water
- Larger urban areas with less green spaces

This will also impact on the environment because our storm overflows and wastewater treatment works, which drain into our rivers and coastal waters, will have to cope with more water.

We want to reduce the risk of flooding and our impact on the environment. The Plan sets out the steps we can take to achieve this.

Who is involved?

It's not only Welsh Water who are involved in putting the DWMP together. The Welsh Government and regulators also have an important role:

- The Government directs water companies to produce this Plan.
- Regulators check on water companies to make sure we are in line with the agreed approach with the government, and that our Plan remains sustainable and affordable.

At Welsh Water, it's our job to supply drinking water and to take away water that's been returned to the sewer, clean it, and then return it to the rivers and seas. Along with others, we also provide a service to take away rainwater and return it to our rivers and seas to avoid homes being flooded.

We're a bit different to other water companies
We are a 'Not for Profit' organisation. We don't have shareholders and every penny our customers provide is put right back into keeping bills down and looking after your water and the environment we all share – now, and in the future[1].

The water industry is a regulated business.
We are a licensed water and sewerage provider operating in Wales and some neighbouring areas of England. As such, our activities are influenced by the policies and legislation of the Welsh and UK Governments.

Ofwat (The Water Services Regulation Authority) regulate how much we can charge customers for the services we deliver. We are also regulated by our environmental regulators, Natural Resources Wales (NRW) in Wales, and the Environment Agency (EA) in England.

There are other official bodies that look after the interests of customers. These include the Consumer Council for Water, which provides an independent voice for water and wastewater customers in Wales and England. Other bodies, such as Natural England, provide science-based and practical advice on conservation matters in England. In Wales, this function has been incorporated into NRW.

Although the DWMP is not currently a statutory obligation for water and sewerage companies in Wales and England, it is included within the Environment Act (2021), and we expect it will be made statutory in 2023.

In addition to water companies, the government and regulators, there are other organisations and people who are involved in the management of drainage systems:

- **Local councils** – control smaller rivers and manage most road drainage.
- **Natural Resources Wales and the Environment Agency** - responsible for main rivers and coastal flood defences.
- **Landowners** - responsible for looking after their own land drainage systems and streams crossing or adjoining their land.
- **Customers** - responsible for private drainage, usually on their property.

Welsh Water is responsible for managing public sewers and sewage treatment works. We are also responsible for our section of the drainage infrastructure that collects rainwater from buildings and yards in our towns and cities. Because the ownership of these drainage systems is fragmented, it's important that we work together with the different organisations and people listed above to deliver the DWMP.

What are we hoping to address?

The nature of the environment we operate in means that future uncertainties are likely to have a big impact on what we do, and the service we provide to our customers. It is

[1] If you would like more information, it can be found at https://corporate.dwrcymru.com/en/about-us/company-structure/glas-cymru

important that we consider both the challenges and opportunities these trends present, so that we can continue to meet customer needs now and in the future.

The key future trends, which we have considered as part of the development of our broader Welsh Water 2050[2] plan, are shown below. The DWMP considers how we will respond to some, but not all, of these trends.

<table>
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Regulatory changes

The UK Environment Act (2021), and several other regulatory changes which will become law in a post-Brexit Wales by 2025, are likely to bring tighter environmental standards, driving significantly increased monitoring and investment costs.</td>
<td> 

Increasing customer and stakeholder expectations

Keeping up with accelerating customer expectations around service levels and technology, while ensuring we retain customer and stakeholder trust.</td>
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Combined storm overflows (CSOs)

Managing issues of river water quality and pollution, linked to many of our oldest sewers, which accept rainwater from roads and property and combine it with sewage. Their impact on the environment will grow with climate change and we are facing increasing public pressure and expectations to resolve such issues.</td>
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Changing climate patterns

The increasing frequency and severity of extreme weather events such as drought and flooding, which affect rivers and other drainage systems that Welsh Water does not manage, together with the sewers that we do.</td>
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Environmental responsibility

Managing the impact of our activities on freshwater biodiversity and ecosystems. Considering the overall environmental responsibility of DCWW in our operations.</td>
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Affordability and potential trade-offs

The constraints of balancing affordability concerns for customers, price caps imposed by regulators limiting necessary investment, and the need to invest in initiatives such as improving infrastructure and environmental protection.</td>
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[2] https://corporate.dwrcymru.com/en/about-us/our-plans

Decarbonisation and sustainable business practices The resource cost and trade-offs linked to implementing the necessary move towards net zero carbon to achieve our 2050 target, as well as the need for delivering nature-based solutions, energy efficiency, circular economy practices, and sustainable supply chains.	**Emerging and persistent contaminants** Continuing to find solutions to legacy contaminants such as microplastics and pharmaceutical compounds. This includes issues with recycling of biosolids/sludge recycling, micropollutants, nitrate vulnerable zone designations and potential associated changes in regulations.
Demographic and behaviour changes The growth of homeworking and its implications and preparing for a growing and ageing population.	**Legacy Infrastructure** Considering the set of risks posed by aging infrastructure and the lack of remaining capacity in our existing sewerage systems.

Above: Table summarising the key future challenges and the need for action

Through longer term planning, and a greater emphasis on working together with others, the DWMP will help us to respond to these future trends and challenges.

Climate change has already brought big changes, including heavy and unpredictable rainfall which happens more often. This leads to more rainwater being collected and transferred to the sewer more quickly, putting pressure on the sewer network, which has a fixed capacity. To protect homes and businesses from sewer flooding, we are often reliant on storm overflows.

Storm Overflows
Storm overflows, or combined storm overflows (CSO's), are designed to operate when it's raining, or shortly after, to help the sewerage system cope. They provide pressure relief and protect customers from flooding by allowing the excess rainfall and sewage to escape to the nearest stream or river. They typically have a limited environmental impact, but some are now operating more frequently throughout the year, not just during the heavy rainfall events that they were designed for.

This highlights the need to review how storm overflows currently work, their impact on the environment and whether they meet the needs of today and tomorrow. This is considered by the DWMP.

We need longer-term and integrated planning carried out by all those responsible for drainage, and more effective procedures for others to work with us to ensure we can meet the scale and complexity of these challenges. These approaches are considered as part of the DWMP.

Why is this document being published?

We are producing the DWMP because we want to have a wastewater and drainage[3] system that is fit for purpose in the 21st century and beyond. We need to ensure that the system protects the environment and reflects the needs of customers today, whilst planning effectively for tomorrow and the needs of future generations.

To do this, we need to ensure that we can more effectively manage urban drainage systems. This means we must work together with many other organisations and landowners who own the drains, ditches and culverts that pass rainwater in urban areas into our sewers or receive the flows from our storm overflows.

We recognise that, as climate change and other pressures affect us, society is about to make an important decision on the future of drainage, and we need to be ready with our Plan to implement it.

The aim of this document is to provide an easy-to-understand summary of the main DWMP, to tell you more about what we are doing, and involve you in our decision making. More detail is available in the main Plan and regional summaries.

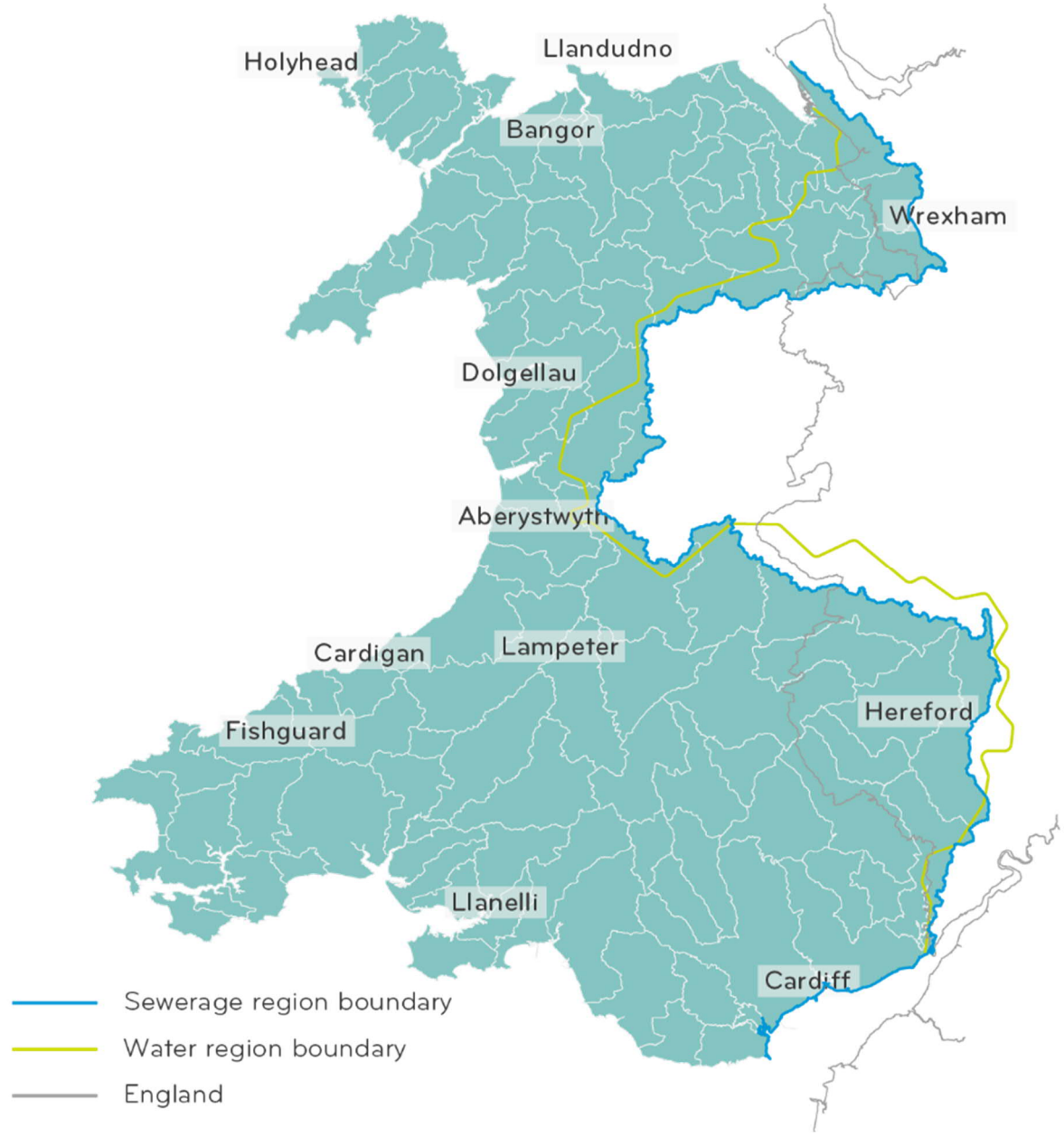
The DWMP will help us to do the right thing for our customers and the environment for the long term. It will help us take a joined-up and more effective approach to addressing some of the biggest challenges we face including climate change, a bigger population and growing urban areas.

[3] Including those other networks that we don't control but which are just as important for protecting the communities we serve.

OUR OPERATING AREA

What does Welsh Water do?

We are the statutory water and sewerage company for around 1.4 million customers in Wales and some parts of England. Our operating area is shown in the map below and this contains some of the most important rivers, and a large number of blue flag bathing waters, in the UK. Part of our role is protecting these.



Above: Map showing Welsh Water's operating area

The table below includes some key statistics on our customers, our company, our assets (i.e., the physical infrastructure we own), and our work with local communities.[4]

 **SERVING OUR CUSTOMERS**		
1.4 million homes and businesses	3 million people in most of Wales, Herefordshire, and parts of Deeside	Over 600 million litres of wastewater treated on an average day
 **OUR COMPANY**		
The 4th largest company in Wales	Employ over 3,000 people	Completed a £1.5 billion investment programme 2010-15
 **OUR ASSETS**		
Maintaining over 30,000km of sewers and over 26,500km of water mains	Managing over 800 wastewater treatment works including improvements to meet new environmental standards and 69 Water Treatment Works	Looking after more than 2500 Sewage pumping stations and 679 water pumping stations and over 2,000 combined storm overflows (CSOs)
 **IN THE COMMUNITY**		
One million visitors to our reservoir sites and visitor centres every year	Over 164,000 children have visited our education centres to date	Looking after 40,000 hectares of land

Above: Table showing key Welsh Water statistics

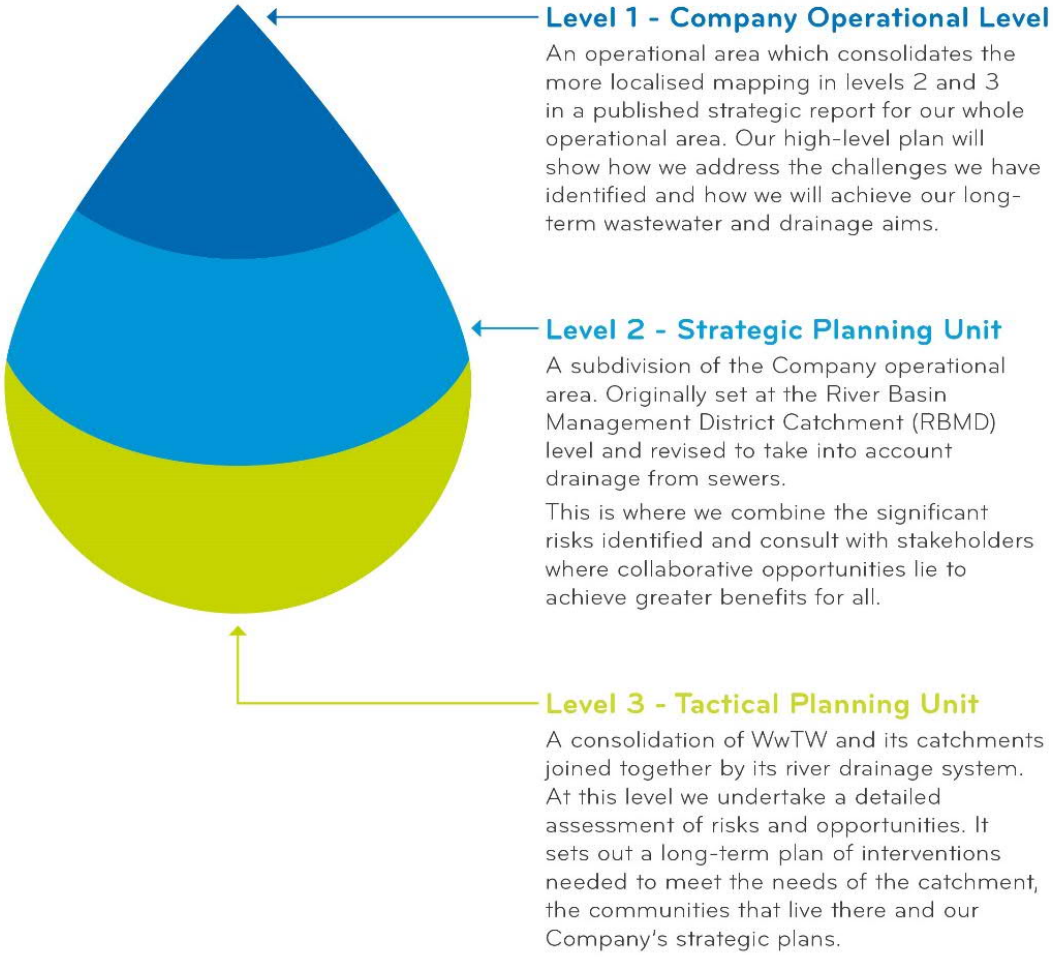
Find out more about how water companies in England and Wales are performing at: https://discoverwater.co.uk/

[4] The table shows outline statistics from 2020. These are subject to change.

How we divided our area for the DWMP

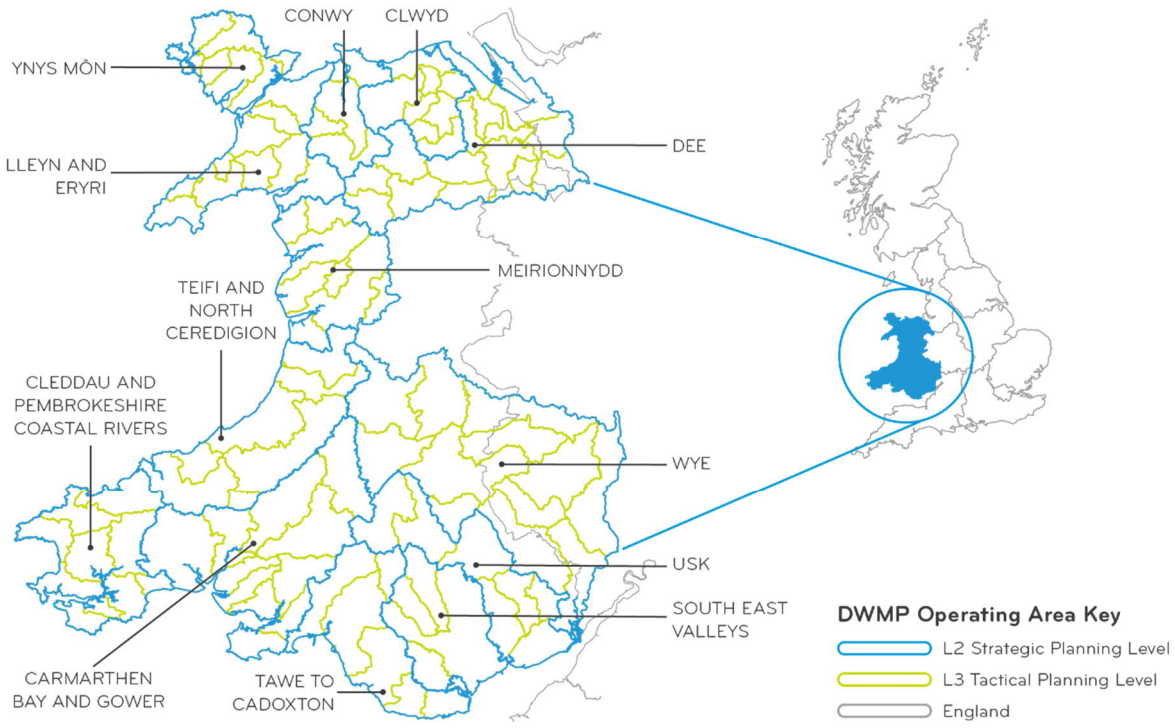
A key part of the Plan is making sure that there is early, continual, and effective engagement between organisations and stakeholders, from a national to a local scale.

We have developed a structured approach to these different scales, using DWMP 'plan areas', to present the findings of our Plan at different geographical levels, as set out below:



Above: Diagram showing how the Plan consists of three levels (Levels 1, 2 and 3)

These levels help us to summarise key messages to allow us to engage with different audiences, as part of the DWMP. For example, we need to use a different approach and different information to speak to a local community about their concerns, when compared to engaging with organisations at a national level. This ensures we have a more structured and responsive approach to engagement, tailored to different people's needs. The image below shows how we have divided up the areas we serve into the different planning levels.



Above: Map showing Welsh Water wastewater operating area

- **Strategic Planning Units**
    - The map above shows the areas we serve which are divided by blue border lines into 13 areas called ‘Strategic Planning Units’. These are also known as Level 2 or L2 areas.
- **Tactical Planning Units**
    - The areas are then divided again by green border lines into 106 areas, referred to as ‘Tactical Planning Units’. These are also known as Level 3 or L3 areas.
- **Company Operational Level**
    - The whole of our wastewater operating area, including all L2 and L3 areas, is called the ‘Company Operational Level’. This is also known as Level 1 or L1.

HOW WE DEVELOPED OUR PLAN

What are the key parts of the DWMP?

Water and sewerage companies have been asked to produce DWMP's for the first time, using guidance from a nationally agreed framework. The framework is a document which sets out the steps we must follow when developing the DWMP and has been agreed with governments and regulators.

Other organisations and interested groups also contributed to the development of the framework. This is a first step on the journey to improve the strategic planning of drainage and wastewater services.

You can find out more information on the national Water UK DWMP Framework by visiting www.water.org.uk

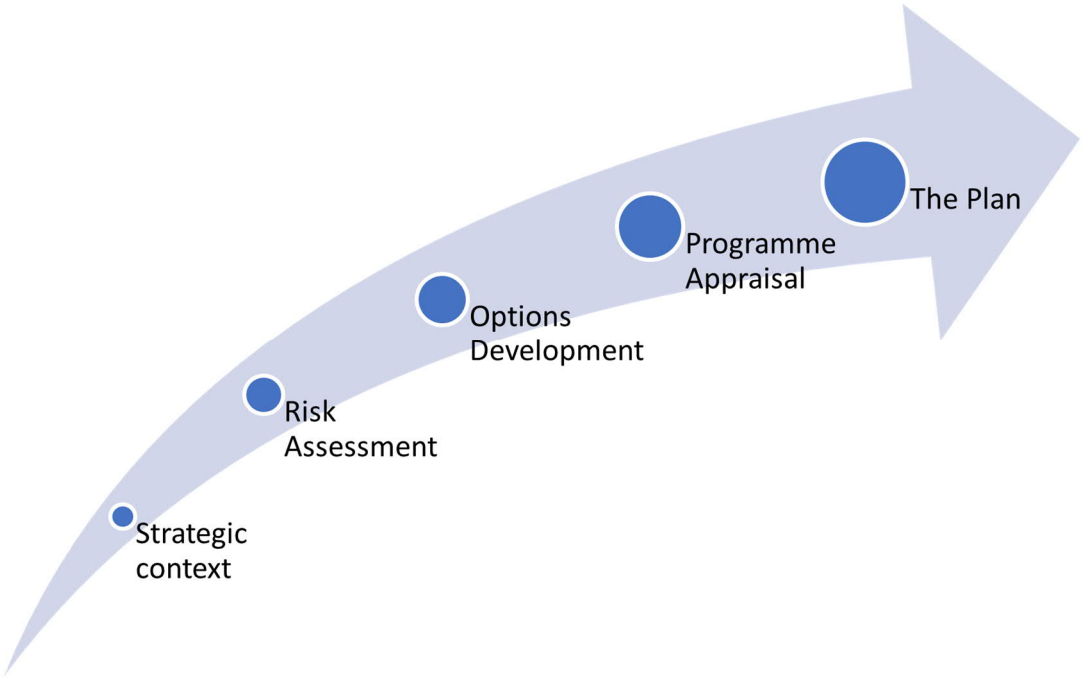
At the start of the DWMP, we set out our long term aims and looked at different ways of achieving these aims. We have also considered when we need to deliver solutions to protect our customers and the environment that we all share.

The main stages for the creation of the DWMP are shown below:

DWMP Process Stage	Description
Strategic Context	The first stage in the DWMP planning process which identifies the big issues faced now and, in the future, as well as actions to address them. It also allows us to consider future aims for the services we deliver.
Risks and Issues	This stage will outline information about drainage and wastewater issues that are already being experienced or have been identified. It will also analyse current and future risks and their causes.
Options Development	The options stage will outline the process of developing solutions to address the risks and their degree of uncertainty.
Programme Appraisal	Take the preferred suite of solutions and assess for various programmes and pace over the life of the Plan.
Draft DWMP	Publishing the Draft DWMP for public consultation (2022). Public consultation of the draft DWMP which will involve public consultation with customers, stakeholders, and regulators.
Welsh Government permission to publish the first DWMP in March 2023.	

Above: Table showing the five steps of a DWMP – Strategic Context, Risks and Issues, Option Development, Programme Appraisal, and publishing of Draft DWMP for consultation

We are now at the point where we want to consult with our customers, regulators, and other interested groups to gather views and feedback on our proposals. This consultation will not only affect the content of the final Plan, but it will also influence the next five-year DWMP planning cycle, which starts next year



Above: Diagram showing the stages of five-year development of DWMP.

The development of the first Plan has been shortened to four years, with work on the later stages of the Plan condensed into two years, rather than three. Inevitably, this has affected what we have been able to achieve in this first cycle.

A summary of the key elements involved in the five-year development process for the DWMP is included below:

Period	Stage	Description
2019	Stage 1 Objective Setting	This stage will be repeated in 2023 for cycle 2.
2020	Stage 2 Risk Assessment	This stage will be repeated in 2024 for cycle 2. In 2024, it will include the Year 1 Annual Review of the last Plan.
2021	Stage 3 Option Development and Environmental Assessment	This stage will be repeated in 2025 for cycle 2. In 2025, it will include the Year 2 Annual Review of the last Plan.
2021 - 2022	Stage 4 Programme Appraisal	This stage will be repeated in 2026 for cycle 2. In 2026, it will include the Year 3 annual review of the last Plan.
2022 - 2023	Stage 5 Consultation Period	Includes production of the daft and final Plan. This stage will be repeated in years 2027 and 2028 for cycle 2. In 2027 and 2028, it will include a Year 4 and Year 5 annual review of the last Plan, respectively.

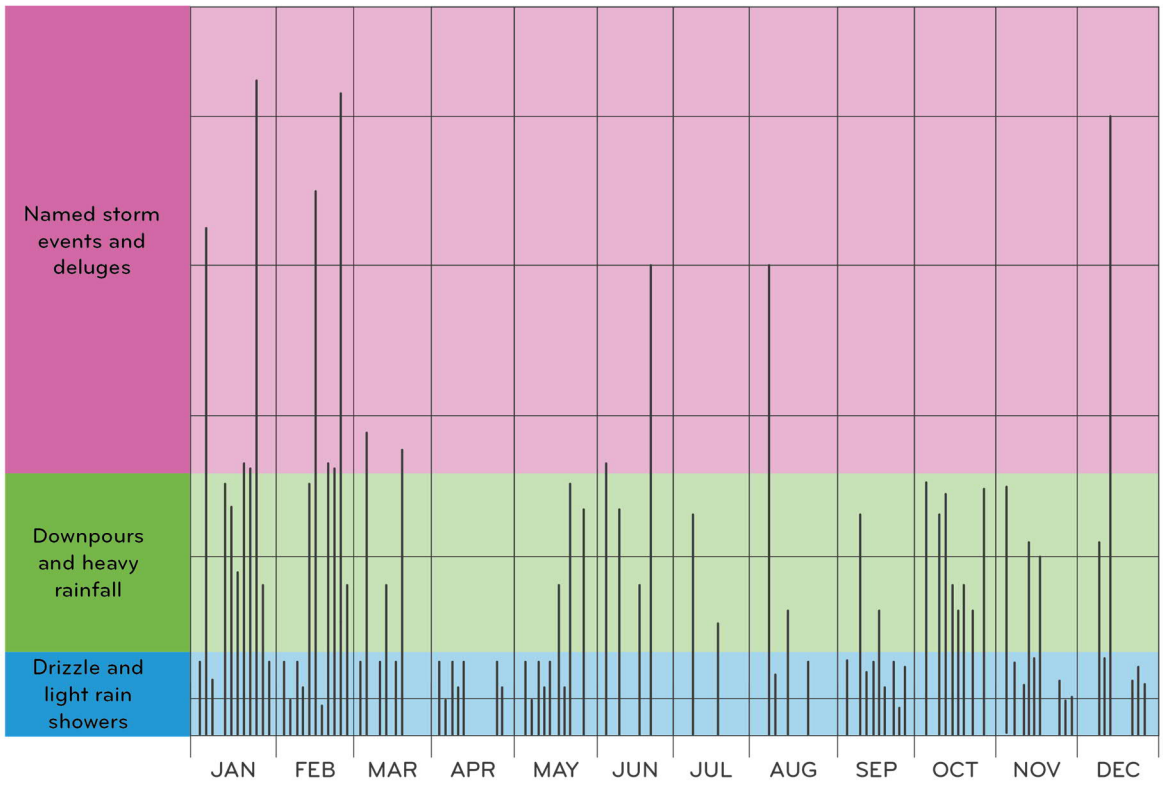
Above: Table summary of key elements involved in five-year DWMP development process

Wales is one of the wettest areas of the UK. This can lead to a greater risk of flooding and a greater reliance on storm overflows, when compared to other areas of the UK. Our Plan considers differing intensities of rainfall and their impact on our sewerage system by effectively combining three plans in one, covering sewage, drainage, and flooding.

- **The sewage plan** - how we protect customers and the environment under dry or light rainfall conditions (typical conditions which we experience during most days of the year). We particularly want to make sure that we can prevent sewage spilling from our storm overflows in this type of weather when they are most likely to have the greatest impact on the environment.
- **The drainage plan** - how and where we need to work with others to manage drainage during heavy rainfall; not just in sewers, but also in other urban drainage systems, such as road drains.
- **The flood plan** - how we will work with others to reduce the risk of overland flooding or flooding from rivers and streams during severe storms.

The chart on the next page shows an idealised typical year of rainfall in Wales. In response to the combined impact of climate change, new development, and increased urbanisation we, and other drainage operators, will have to increase the amount of sewage and rainfall that we can deal with over the long term. This is vital if the risk of flooding and pollution is to

be managed and reduced in the long term. The chart shows these three elements of planning, where the sewage plan is displayed as the blue band, the drainage plan as the green band and the flood plan as the pink band.



Above: Chart showing a typical year of rainfall in Wales and defined areas of rainfall intensity and frequency

How have we considered risks to customers and the environment?

The DWMP allows us to look at the consequences of increasing rainfall (due to climate change) and increasing sewage flows (due to new development and increased urbanisation) both now, and in the future, and how the associated risk of flooding and pollution will increase over time.

To do this, we combined our long-term objectives with feedback from customers and stakeholders into three high level planning themes:

1. **Water quantity**

   Reducing the risk of flooding to communities.

2. **Water quality**

   Improving water quality for the environment.

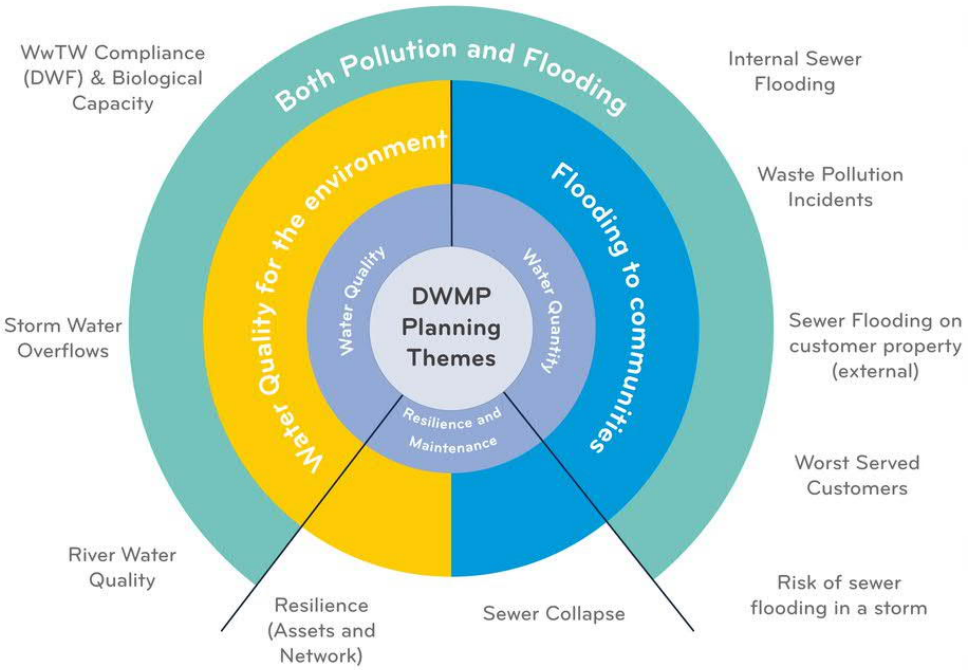
3. **Resilience and maintenance**

   Making sure we can adapt to changes in the future, whilst also maintaining important services and protecting the environment.

Resilience
Ensuring we have a resilient wastewater and drainage network is vital and requires several key organisations to work together on a range of different themes, from assets and systems to people and culture. Responding in this joined-up way will allow us to respond to known and unknown challenges far more effectively, delivering the widest possible benefits for communities.

These themes are underpinned by more detailed national planning objectives, which allow comparisons to be made between the water and sewerage companies by our regulators. Our own specific objectives will also help us to anticipate risk and be prepared to respond. The objectives will inform our detailed action plans and will help us to achieve our vision, mission statement and Welsh Water 2050 objectives.

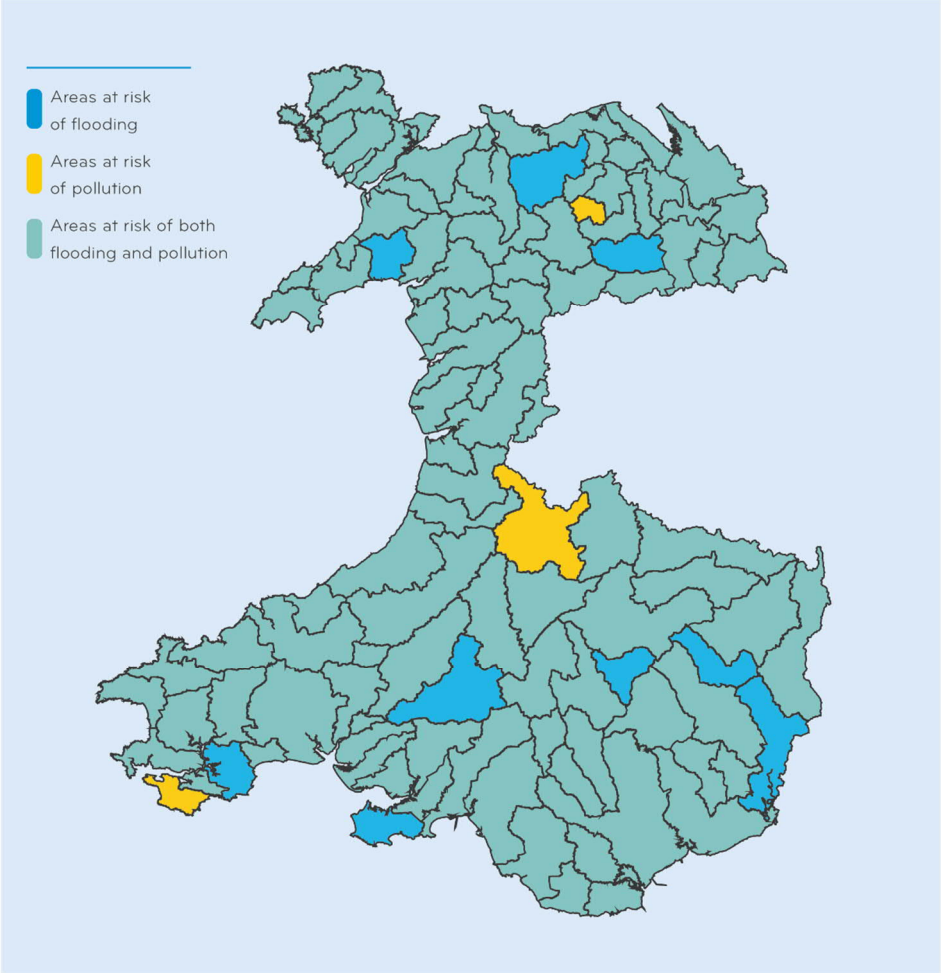
The diagram below shows an overview of the key themes and how these relate to water quality for the environment (pollution) and flooding to communities. The outer circle reflects how many communities will have current or future sewer flooding risk but that the local streams and rivers are also expected to be impacted from storm overflows.



Above: Diagram showing key planning themes and links with risk areas

By assessing the impact of key future challenges over the next 25 years we have been able to identify the areas that could be at increased risk of sewer flooding (where our sewers could be overloaded by the amount of rainfall draining into them) and a reduction to water quality and increased pollution (where discharges to the environment, from our storm overflows and treatment works, may not meet acceptable standards) by 2050, if we do not invest and take preventative measures.

The map below shows that most of the area we serve, which we have broken down into 106 planning zones, will have increased risk of flooding, pollution, or both, without the DWMP process and investment. It also shows where we want to work with others and whether that is on flooding, improveing water quality or both.



Above: Map showing areas at risk of flooding and pollution in 2050 if we do not start to invest.

Pollution in rivers – where does it come from?
Pollution in our rivers comes from different sources. These include wastewater treatment works and private septic tanks, agriculture, mining, urban runoff, storm overflows, forestry, atmospheric deposition, and roads. The actual impact of any pollution is dependent on the pollutant, the sensitivity of the river, and the degree to which the pollutant is diluted.

How do we manage river and coastal water quality?
Our environmental regulators manage water quality at rivers and coastlines. As a water company, we can have a significant impact on these areas. We work closely with regulators on how we can support environmental quality objectives.

We test and report on the quality of water that is discharged from our wastewater treatment works, to Natural Resources Wales (NRW) and we report on how well we are doing annually. In addition, we work with regulators to understand what proportion of the pollution entering our rivers and coastal waters comes from our discharges. This helps us to focus our investment where it is needed most to help protect the environment.

Climate change may change the water levels in our rivers, particularly during dry summers. This means that, if we continue operating as we do today, it will become more difficult to ensure our rivers remain healthy.

Identifying opportunities to work with others is an important part of developing a DWMP. We have developed key areas and topics to start on this process with our stakeholders. Examples of such opportunities include working with local authorities and schools to reduce their water use and help pinpoint opportunities to reroute rainwater to their school grounds. Working with stakeholders in explored in more detail in the ‘Engagement’ section of this document.

Engagement

From the outset, the views of Government, stakeholders, regulators, and customers have been an important component of the Plan. We have been talking to all these groups and we have carried out research with our customers to ensure their views have been reflected in the draft Plan.

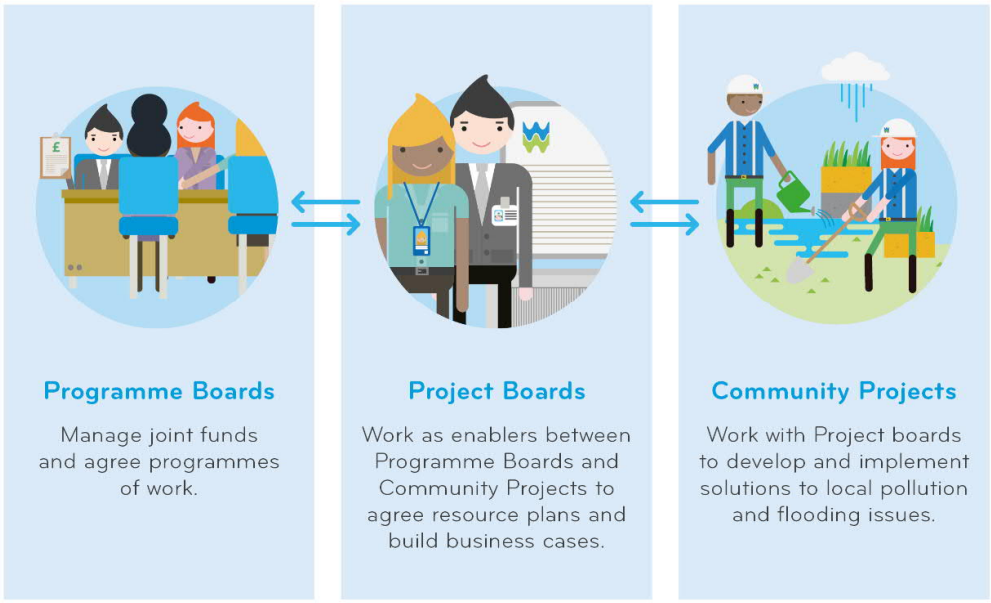
The engagement process does not stop with the publication of this first DWMP. We are working with government, regulators, local authorities, and community groups, at a level that works for them.

What is engagement?

By engagement, we mean a broad and ongoing process of sharing information and updates with all our stakeholders, getting their feedback, and acting together. Stakeholders are individuals and organisations that have an interest in what we are doing.

The purpose of engaging with our stakeholders is to create opportunities for joint solutions, maximising the benefits of our proposals to local communities and to inform the decision-making process and development of the DWMP.

As we move from engagement to looking at opportunities for co-investment, we will need a more detailed planning structure to support the process. We expect this governance to be provided through a network of Programme Boards, Project Boards and Community Projects, as shown in the image below.



Above: image showing joint working structure to support the engagement process

How have we engaged with our customers?

We are committed to bringing the voice of customers into the heart of our business and the DWMP. We want to understand customer views of the Plan, particularly in terms of how quickly we make improvements, as this will have an impact on water bills.

To support this, we carried out research to gain a representative picture of our customer views and help them to help shape the development and speed of changes outlined within the Plan.

We have also met regularly with our Customer Challenge Group. This is an independent group of individuals from organisations who provide scrutiny of our plans, from a customer perspective.

Working with our customers
Throughout the development of the Plan, we have worked closely with our customers through a series of research sessions. These sessions have allowed us to assess customer awareness, expectations, and levels of support for different options.

This has fed into the development of the Plan, ensuring that the outcomes are in the best interests of both existing customers and future generations who will benefit.

Our findings show a strong link between customer priorities and our objectives for the Plan; these include planning for the long term, acting in an environmentally friendly way and providing good value for money.

A customer's view from the research
Feedback from one customer taking part in the research highlights the theme of cost to the end user. The feedback, included below, noted that whoever is responsible for the work, the customer pays and wants to see value for money. The customer also wants to see Welsh Water working closely together with other organisations to deliver more efficient solutions.

"We pay the water company. We pay tax. We pay council tax. Can you just be efficient with the money?"

(This quote has been edited and shortened for inclusion in this document).

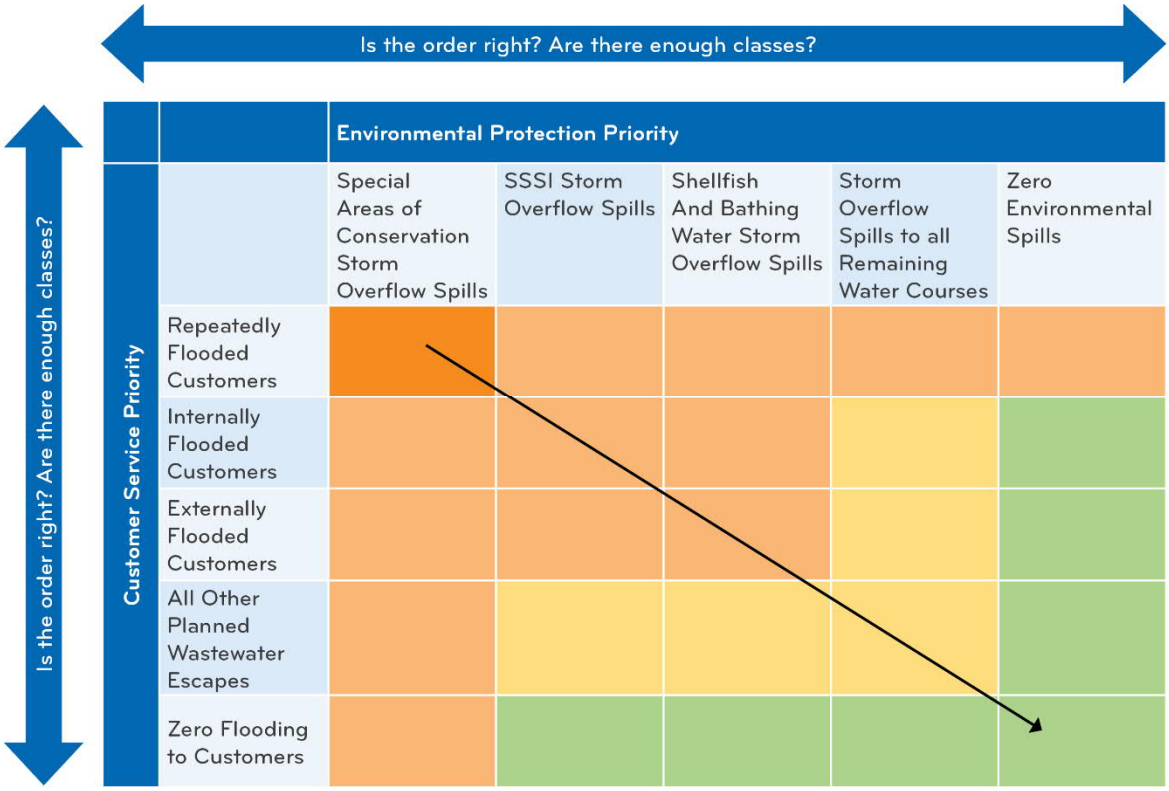
PRIORITIES FOR INVESTMENT

Our overall goal is to ensure that we can protect our customers and the environment in all the areas we operate in. We cannot do it all at once. As such, we need to better understand what we should prioritise first.

Our approach allows us to maximise the benefits we can deliver for both customers and the environment at the same time. This means that we will concentrate on the places with the worst levels of flooding, and those areas which are the most environmentally sensitive from the effects of storm overflows, first.

We will then look at internal and external sewer flooding, SSSI and bathing water impacts from our discharges to the environment, and so on, until we reach our end destination.

The matrix below provides a visual overview of how we will reach that destination, starting in the darkest orange and gradually working towards the green.



Above: Matrix showing customer service and environmental protection priorities.

Why do we need to develop a programme of work?

The DWMP sets out the choices that we must make to deal with risks. These risks will become a reality if we do not invest for the long term.

We want to deliver continuous improvement across Wales and the borders which reflect the different characteristics of these areas, such as high mountains or steep sided valleys, and flat plains.

There are also new requirements for water companies outlined in the Environment Act 2021, highlighting the importance of having a robust understanding of the capacity of sewerage and drainage systems.

Statutory Environmental Improvement Programmes (NEP) (National Environment Programme and Water Industry National Environment Programme)

We deliver investment aimed at improving the protection of the environment at the direction of our environmental regulators Natural Resources Wales (NRW) and the Environment Agency (EA).

We have not included these in this DWMP. However, our new environmental forecast model has indicated several sites that could be part of a future programme. We will investigate these as part of the Plan's development to inform the next cycle and work with our regulators to improve how we do this. As the NEP programmes become known and further information provided by our environmental regulators over the next 3-6 months, we will include them into the revised draft where possible.

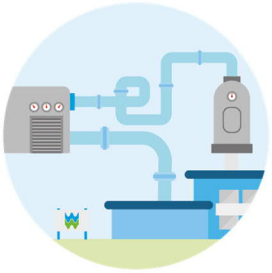
How have we assessed sewer capacity?

To develop the solutions needed to reach our chosen destinations we have followed the stages of the national DWMP framework, shown above. However, because this is our first DWMP, we have had to collect the data and develop the tools to make these assessments.

We have developed a process for the Plan that will allow us to quickly target the highest priority areas at a local catchment level at an early stage in the DWMP process. It also allows us to monitor progress and carry out annual assessments more easily.

Our method for forecasting and understanding capacity includes:

- Defining the capacity of the environment.
- Defining the capacity of treatment facilities.
- Defining the capacity of the drainage network.

Defining the capacity of the environment 	• Understand the flow and quality of the river or coastal water today and how they will change in the future. • A key challenge in this area relates to how changes in the environment, resulting from climate change or different land use, may affect the quality of river and coastal waters, particularly when combined with population growth. • This is important as changes in this area will have a direct impact on planning where and when we should invest.
Defining the capacity of treatment facilities 	• The capacity of our wastewater treatment works has been taken from the legal permit conditions that govern their operation. • We have identified treatment facilities that may not have enough capacity in the future and, with scenario planning, considered which are to be prioritised first. We have listed these for further investigation as part of the Plan.
Defining the capacity of the network 	• We have carried out an assessment of network capacity by looking at how much water and sewage enters the network under conditions of light rainfall or dry weather. • We have also considered how much network capacity we need during wet weather to protect our customers from flooding. • This has allowed us to pinpoint areas where pipes might not be big enough or where we need to reduce water flows. • To prioritise this assessment, we have used a scenario approach considering different forecasts for what the future could look like in terms of climate change, a bigger population and growing urban areas. • Overall, this process allows us to understand whether the current network can meet the needs of today and tomorrow.

Above: DCWW rapid capacity assessment approach

Image courtesy of St John Archaeology

Above: Illustration of the capacity of a typical sewer.

The capacity of a sewer pipe is shown in the illustration above. The amount of flow in the sewer usually increases at peak times, such as when we get up in the morning, and drops during the night. This is known as ‘dry weather flow’ and all sewers must have enough capacity to carry these sewage volumes.

Capacity can also be used up by a heavy rainfall event. The more rainwater that enters our sewer during a storm, the more capacity of the sewer is used. When the capacity of the sewer is exceeded, there is a risk of sewer flooding. The aim is to ensure that every pipe has enough spare capacity so that sewage is contained.

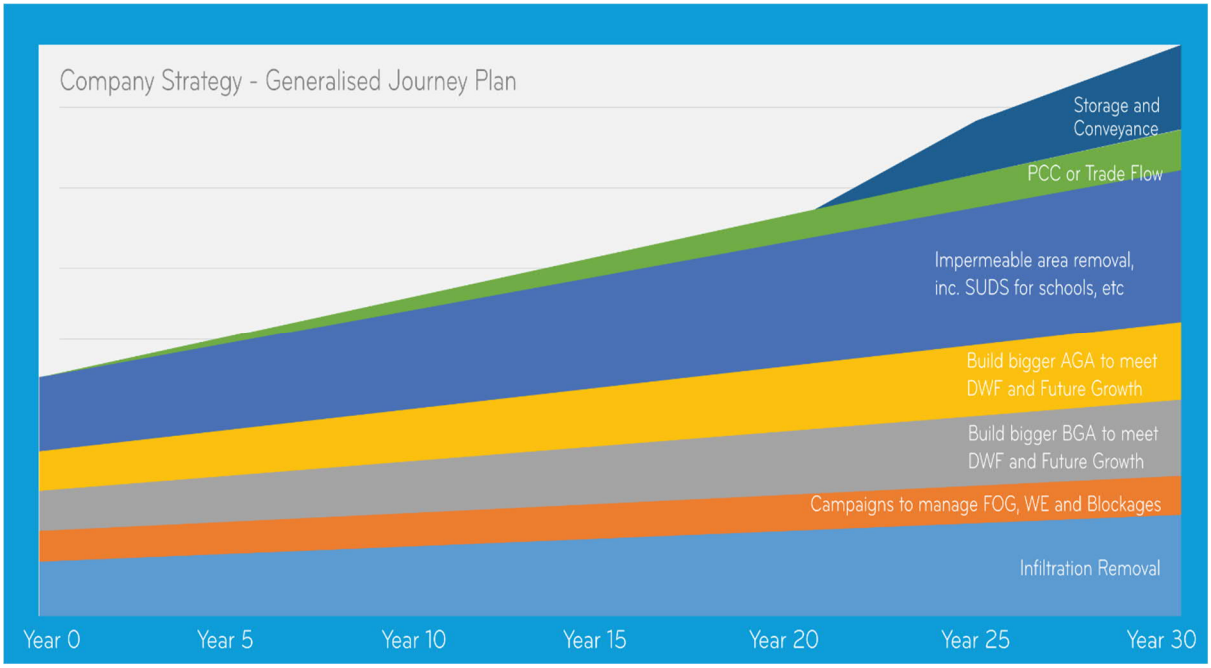
Our analysis shows that, several areas do not have sufficient sewer capacity, not even to allow new development, or the impacts of climate change. When it comes to our sewage treatment works, on average, we have just enough wastewater treatment capacity to treat today’s sewage flows, except for in one geographical area.

Our Plan, which seeks to address these shortfalls, looks at the value of different approaches in terms of cost, impact on flooding and pollution, and the wider benefits for local people, nature, and the environment. The Plan also considers whether we can make changes on our own, of if we need to work with others to deliver these changes.

Our approach lists a **hierarchy of actions** which include:

1. Preventing groundwater getting into sewers
2. Educational and information campaigns for customers on how they can help
3. Surface water removal from sewers with storm overflows and building bigger pipes
4. Pumps and treatment works to manage future developments and population changes

The more surface water we can remove from our sewers, the less vulnerable we are to heavy rainfall and storms which cause flooding and pollution. However, this means redirecting rainfall into other drainage networks. As such, we must work with local authorities, the NRW and the EA to agree this work and the ways in which they can support us.



Above: Chart showing company strategy over the next thirty years, and how different assessments are used to feed into the strategy.

The chart above has been included as an overview of company strategy over the next thirty years. It is explained in more detail in the points below:

- Bottom axis of chart shows year 0 to year 30. Layered above this are the actions to be taken over the years, in order of priority and starting with this first Plan in year 0.
- Each catchment area generally has the same, or very similar, interventions. They are:
  - Removal of infiltration (year 0 to year 30).
  - Educational campaigns for customers (year 0 to year 30).
  - Building bigger below ground assets to meet dry weather flow now and in the future for new development and increased urbanisation – not including climate change (year 0 to year 30).
  - Build bigger above ground assets (pumps and treatment works) to meet dry weather flow now and in the future for new development and increased urbanisation – not including climate change (year 0 to year 30).

- Remove surface water from the sewer and build sustainable drainage systems – for climate change (year 0 to year 30).
- Reduction of public water consumption and trade flow (year 0 to year 30) Increased storage and conveyance (starting in year 25, with the expectancy that future innovation and take-up alters the next Plan).

Managing water consumption is just one of the ways that customers can help.

Our sewers are designed to take away the 3 P's:

- Pee
- Poo
- Paper (toilet paper)

Unfortunately, some customers flush other things down their toilets such as wet wipes and even nappies. The sewer struggles to keep these non-flushable items moving along the pipes and they often collect, causing blockages.

Welsh Water deals with about 20,000 sewer blockages annually.

You can find out more information at: https://www.dwrcymru.com/en/stop-the-block

Sewer blockages can lead to both flooding and pollution to the environment. Like controlling rainfall going into our sewers, we are reliant on customers doing their bit to help us meet our long-term destination in a cost-effective way.

What about the issue of storm overflows?

For the first version of the Plan, we have considered legislation and policy to put together recommended options and outputs. At the time this draft Plan is being published, the Welsh Government are gathering evidence to review their policy in relation to storm overflows and publishing their CSO roadmap. A DEFRA consultation is also running focusing on the future role of storm overflows.

We have considered the likely outcome of this policy and legislation in advance of government conclusions and produced some alternatives to help inform the debate. We must look at all areas where we need to improve, not just storm overflows. Customer flooding, for example, is a great risk to human health and must also be prioritised.

What about the potential impact of our proposals on the environment?

Our Plan is significant and far reaching. As such, we must consider the wider impact on the environment. To do this, we embedded the principles of the SEA (Strategic Environmental Assessment) and HRA (Habitat Regulation Assessment) early in the Plan development

process. We are legally required to complete these assessments, which ensure that there would be no environmental harm caused by the projects that the Plan has prioritised.

If the assessments show that a project will harm the environment or habitats, we investigate why that is and if it cannot be adjusted, we rule it out and choose an alternative option. In some cases, there may not be an alternative and we highlight this so that everyone that wishes to, can comment on it. Options which harm the environment or habitats can only be included in the Plan where there is an overriding public interest.

The SEA and HRA are available as part of this consultation process and will also be informed by stakeholder input. Final versions of these will be produced after the consultation.

THE COST OF THE PLAN

What investment will be needed over the next 100 years?

Our planning themes and objectives allow us to develop the Plan, but we also have an end goal or long-term 'destination'. The DWMP helps us to set out the steps we need to take to reach these longer-term goals. Our customer and environmental destinations are summarised in the box below:

*Customer destination** is a time in the future when customers will no longer have flooding from sewage inside their homes or businesses or on their property due to a lack of ability to contain it

*Environmental destination** is a time in the future when our rivers and coastal waters no longer receive untreated flows from our sewerage system, protecting their biodiversity and ecology.

* We need to understand under what conditions this destination applies, drizzle to deluge.

We are proposing two stages to achieve our environmental and customer destination:

1. We start with the worst problems and focus on fixing these first.
2. We then move onto the 'next worst' problems, until the point at which we have addressed all the problems.

To meet our longer-term destinations, significant investment will be needed, which will have an impact on customer bills or will take around 100 years to achieve. These costs have been estimated in the table below based on Three possible longer-term 'destinations':

Category	Zero storm overflow spills and no sewage flooding in customers' homes due to lack of capacity	10 spills per year from storm overflows and no sewage flooding in customers' homes due to lack of capacity	40 spills per year from storm overflows and no sewage flooding in customers' homes due to a lack of capacity
Cost of customer destination	£13.513 Billion	£13.5133 Billion	£13.513 Billion
Cost of environmental destination	£8.477 Billion	£3.206 Billion	£1.175 Billion
Total	£21.990 Billion	£16.719 Billion	£14.688 Billion

Above: Table showing costs related to three possible longer-term 'destinations'. These costs are subject to change and have been included for illustrative purposes.

The likely costs of the long-term plan shown above represent our first estimate of the cost of carrying out this work and we know that once we have achieved that destination there will be

more cost on top to keep to that destination. However, it is important to note that there are many other destinations, and combinations of destinations, that the DWMP can produce cost estimates for. Those outputs can be used to inform the debate with government, regulators, and customers about the most appropriate pace of investment.

Storm Overflow Evidence Project
The Storm Overflow Evidence Project (prepared for the Storm Overflow Task Force in 2021) estimated the cost of eliminating storm overflows in England alone at between 150 and 600 billion pounds. A similar project is currently underway in Wales. We expect it to come to a comparable conclusion.

Breaking down investment into manageable stages

We have looked at the areas with greatest customer and environmental risk and assessed each localised area to identify how much a traditional solution would cost and how much a sustainable solution would cost. We compared the costs and benefits of these solutions to produce a list of preferred best value schemes. We have determined from numerous solutions a preferred best value plan of 173 projects with two programmes of opportunities to work with our stakeholders.

What investment is needed between 2025 and 2050?

For those areas included within the preferred plan, considered when these solutions can be delivered, and in which order by 2050. We also considered how this would affect customer bills, especially at a time when the cost of living is increasing sharply. We have also considered how much we should invest over the next 5 years, between 2025 to 2030.

The costs included in this plan covering the next 25 years reflect areas where customers already experience repeated internal sewer flooding and or Storm overflows that spill to a SAC. Once the plan is finalised, we will continue to develop solutions to the remaining risk areas as suggested in our preferred approach for inclusion in our next plan.

For those areas we think will be at greatest risk of flooding and pollution over the next 25 years, we need to plan when solutions can be delivered, and in which order. To do this, we carried out an *appraisal* of when we should invest. This considers if it is better to invest sooner (between 2025-2030) or later. It also considers how this would affect customer bills, which is particularly important at a time when the cost of living is increasing.

The appraisal has allowed us to develop several different scenarios to prioritise investment of around £1.29[5] billion over the coming 25 years:

Scenario	Description	Cost
Scenario 1	Ignore affordability and only consider the risks when they start to affect	• Around £650[6] Million by 2030 • £160 million every 5 years up to 2050

[5] These costs are all in today's terms without inflation or other cost increases applied.
[6] These costs are all in today's terms without inflation or other cost increases applied.

	customers and the environment	
Scenario 2	Minimise the cost for customers in the short term	• Investment programme of £60 Million every 5 years for 25 years • A further £992 million programmed after 25 years
Scenario 3	Varying investment over time	• £60 million between 2025 and 2030 • £240 million between 2031 and 2040 • £480 million between 2041 and 2050 • Leaving £511 Million after 2050
Scenarios 2 and 3 will be more affordable and address less risks when compared with Scenario 1.		

We expect that investment of £1.29 billion would allow us to deliver 117 projects to reduce the risk of customer flooding (costing £348 million), and 53 projects to reduce discharges from storm overflows (CSOs) (costing £942 million).

The cost of the first scenario would be around £36 per customer every year for the 25 years of our programme. This could result in some increases to customer bills or mean that we need to stop doing other activities to fund this.

We have undertaken a Strategic Environmental Assessment and Habitats Regulations Assessment of our preferred options (see separate report on their findings). Several schemes were assessed that could have minor negative outcome to the environment in the assessment. We are going to delay the proposed start of these options while we investigate the cause of the minor negative assessment however the need for a solution is still there. The impact of this adjustment has reduced the total number of projects to 107 however with now reassurance that any environmental impact in their operation is positive. The investment of £386 million is made up of 93 projects to reduce the risk of customer flooding costing £269 million and 14 projects to reduce discharges from storm overflows (costing £117 million) Please note however the number of projects relating to storm overflows includes a scheme with a large geographical area and should be considered as a multistage project.

Following assessment and comparison of results as part of the DWMP, the final list of options is passed onto the business. Solutions are then incorporated into the 'price review' process to support their funding in future decades. This price review process is regulated by OFWAT, our financial regulator.

We will only know which solutions will be delivered when OFWAT conclude their assessment. We will then re-review our solutions and this will form part of the annual DWMP review, it will also become the starting point for the next plan to be published as draft in 2027.

What does this really mean in terms of investment in 2025 to 2030. The management plan is not a business plan. It can inform and provide evidence for a business plan but during this cycle we must take stock of the conclusions and consider our customers and stakeholders comments on our process. We can conclude that we need to further refine our solutions into

smaller shorter term milestone schemes and reflect on the outcome of current research to incorporate customer direction on pace, types of solutions and the final destination. We will continue to work with our financial regulator OFWAT to learn how to make a stream lined process between Management planning, Business planning and the regulators Final determination and support for funding.

Developing opportunities

Our preferred approach builds on traditional ways of planning to better understand not only our drainage network but how drainage interacts overall. This is so we, as a society, can be more efficient with our investment, as when we work together with other organisations, we can deliver more benefit for society than we can alone.

This means we can work together with others to develop joint funded solutions that meet the needs of both the community and the environment and do the right thing and set us on the right path for future generations to come.

Initially we have identified two programmes that could help green our schools and public spaces such as car parks while at the same time slowing the rainfall allowing it to soak into the ground supporting our environment locally.

Outcome of this appraisal

We have developed projects that focus on our greatest priorities. We have learnt that some projects could be perceived to have a negative impact on the environment. We understand that we need to alter how our projects are created. We have looked at our approach and can see there is a need to start our investment plans as soon as practicable and where this plan indicates. The options in this plan for 2025 to 2030 will be put forward into the business plan to make the case for these schemes to be funded as part of the business plan process.

OUR PREFERRED APPROACH

What approach should we take to develop our investment programme for the next 25 years?

This is the first time we have produced a Plan like this. We have learnt a lot during its preparation and there are some improvements we need to consider for the next Plan. Some of these improvements have been included in the proposal, as we have developed a better understanding of how the way in which different solutions are developed can have a significant impact on the final programme.

We have trialled different approaches during this first DWMP cycle because we wanted to find the most efficient way of bringing greater benefits to both our customers and the environment. We want to ensure that we make smaller improvements but many more of them over a greater area. We have prepared two approaches for consideration during the consultation of the draft Plan, and these are set out below.

1. **Preferred approach** – As part of the Plan we have looked at how to improve both storm overflows and network capacity at the same time:
    a. On an incremental improvement basis: We would aim to incrementally improve network capacity to reduce storm overflows and sewer flooding risk at the same time. This would mean that we are gradually improving all areas slower over time by increasing overall system capacity. The incremental steps being to achieve the sewage plan everywhere, then step to the drainage plan and finally the flood plans, while still maintaining company level performance.
    b. Small Zone approach – In some areas an incremental approach would not be sensible. In these areas we will develop solutions to reach the final destinations in as few steps as possible. Still looking at reducing the impact of both storm overflows and customer sewer flooding but for the whole zone.
2. **Standard approach** – This would involve continuing with the current approach of investing to meet company level performance commitment targets agreed with regulators. This would continue to improve overall company level performance, and we would continue to focus on individual ‘hot spots’. This does not take account of the way our networks, pumping stations, wastewater treatment works, and rivers, are all interlinked to manage the water cycle and drive performance targets locally.

Maintaining compliance

Both approaches ensure that compliance to our operating licence and environmental permits are maintained.