

United Utilities Water

Drainage and Wastewater Management Plan

Waver Wampool DWMP

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Glossary

For the glossary, refer to document C003.

1. Introduction to DWMP

The Drainage and Wastewater Management plan (DWMP) is a long-term plan setting out how we intend to maintain robust and resilient drainage and wastewater systems, now and in the future. Whilst long term planning for wastewater has always been undertaken, this is the first time that we are developing a region wide plan in this format, and we have taken a comprehensive approach as we recognise the importance of long-term planning and the increasing need for partnership solutions.

The heart of the plan will be built around collaborative and innovative working, while encompassing all activities relating to drainage, flooding and delivering a wastewater service that protects the environment. We have led on this plan, but have developed it in consultation with our partners as we will be delivering the DWMP in partnership with other organisations such as the Environment Agency and local councils.

By developing the DWMP, we have an opportunity to:

- Provide a basis for more collaborative and integrated planning alongside stakeholders across the region to tackle shared and interrelated risks relating to drainage, flooding and protecting the environment;
- Strengthen partnership working with all key stakeholders to drive integrated investment in the environment and communities;
- Develop a plan that will help address the increasing environmental expectations from customers and stakeholders and work towards the ambitions set out in Defra’s 25-year plan;
- Collectively explore innovative solutions such as Sustainable Drainage Systems (SuDS) and nature-based solutions to understand what is best for the North West; and
- Embed Systems Thinking to better understand drainage and environmental interactions, and to maximise the potential for integrated solutions.

Throughout the DWMP process, we have engaged with stakeholders to share our data and findings, to ensure that the solutions delivered are co-created, drive efficiencies and will benefit the communities and environment that we live and work in.

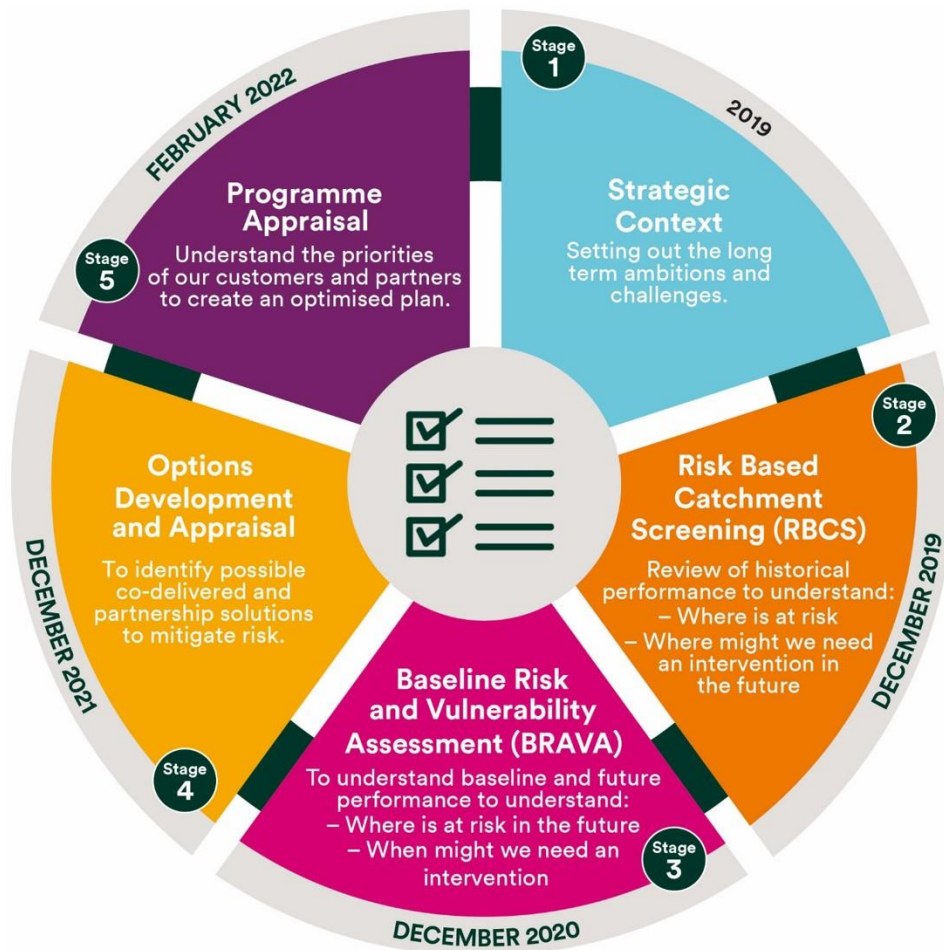
The plan will be set out at three levels (Figure 1) to maximise the potential for partnership working and for effective engagement between regulators and stakeholders at both company-wide level and more locally.

Figure 1 Geographical scales applied for planning and collaboration within DWMP



The plan is made up of five main stages (Figure 2) which each contribute to developing the most sustainable and effective future for the North West. These stages include setting out the long-term ambition for the region, identifying risk and understanding the possible interventions and solutions that could be developed.

Figure 2 Five stages of the DWMP



Across the North West, there are 14 Strategic Planning Areas (SPAs) and the purpose of this document is to share local, place-based information.

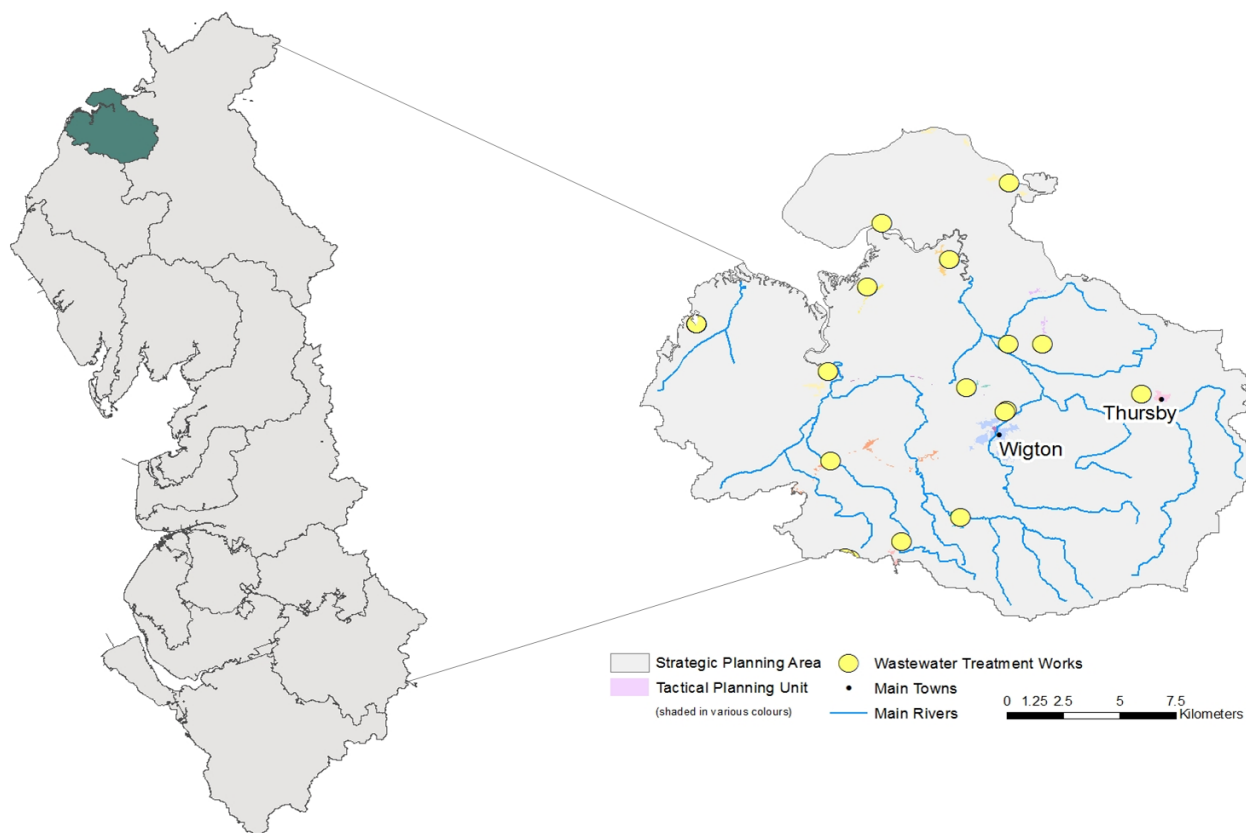
We will share the results from the different stages of the DWMP and how the DWMP plans to make a difference in the Waver Wampool SPA.

2. Background to the Waver Wampool catchment

The Waver Wampool is a small catchment (374.6km²) in north-west Cumbria ^[1]. The land use in the catchment is largely composed of agricultural land with a number of smaller conurbations such as Wigton and Thursby ^[2]. The River Weaver and the River Wampool drain the north Lake District fells westerly through the flat Cumbrian coastal plains where they eventually drain into the sea at the Solway Firth in the north-west of the catchment ^[3].

There are 14 wastewater tactical planning units (TPU), also known as wastewater treatment work (WwTW drainage catchments) within the Waver Wampool SPA. A TPU is the drainage area including all the sewers and wastewater assets e.g. pumping stations, which drain to the associated wastewater treatment works. The TPUs within the SPA vary in size from larger catchments such as Rabycote to smaller, rural catchments such as Oulton. The TPUs are highlighted in Figure 3.

Figure 3 Map of the Waver Wampool SPA



There are numerous strategic management plans within the Waver Wampool that are owned by various other organisations. Within the Waver Wampool catchment, there are active management plans such as:

- The Environment Agency River Basin Management Plan (RBMP) and Flood Risk Management Plan (FRMP);
- Lead Local Flood Authority (LLFA) Surface Water Management Plans (SWMP);
- North West and North Wales Coastal Group Shoreline Management Plan (SMP); and
- Local council plans.

Each of these strategic plans focuses on managing particular risks and links to programmes of work. A high-level summary of these management plans is shown in Table 1.

The DWMP aims to collaborate, share best practice and to align with other strategic plans throughout the catchment. This will help to highlight common challenges, ambitions and goals where there are shared or interconnected risks and opportunities.

Table 1 Summary of stakeholder management plans

Management plan	Overview	Key aspects for the Waver Wampool catchment
<p>River Basin Management Plan (RBMP) ^[4]</p> <p>Owner: Environment Agency</p>	<p>A river basin district covers an entire river system, including river, lake, groundwater, estuarine and coastal water bodies. The RBMP aim is to improve the quality of our water environment to best support wildlife, agriculture, and businesses, and to boost regeneration and recreation.</p>	<p>The main reasons for not achieving good ecological status are physical modifications and pollution from rural areas.</p> <p>Future challenges predicted by the Environment Agency include invasive non-native species, changes to natural flow and water levels, physical modifications and pollution from wastewater, agriculture and rural areas.</p> <p>Future challenges predicted by partnerships include changes to the natural flow and water levels, physical modifications and pollution from wastewater.</p>
<p>Flood Risk Management Plan (FRMP) ^[5]</p> <p>Owner: Environment Agency</p>	<p>The FRMP is a strategic plan, which reviews and develops measures to manage the risk of flooding from rivers, the sea, surface water, groundwater and reservoirs. The plan outlines flood risk areas, hazards, and sets out measures and objectives to manage flood risk.</p>	<p>The Waver Wampool SPA covers both the Solway Tweed and the North West River Basin Districts (RBDs).</p> <p>The Solway Tweed catchment is a cross border river basin that includes both English and Scottish waterbodies and covers an area of approximately 17,500km². The area is home to around 450,000 people with important economic activities including agriculture, tourism, forestry and manufacturing. In the English section of the catchment, there are approximately 29,000 people living in estimated areas of flood risk with 2,500 of these people living in areas deemed a high risk (1 in 30 chance of flooding in any given year). The main river flood risks identified in the Waver Wampool catchment is Wigton.</p> <p>In relation to coastal and tidal flood risk, the Solway coast is overall low-lying and due to it being a soft sedimentary coast with a large tidal range, this coastline is deemed highly dynamic. Areas such as Kirkbride have historically been prone to flooding. Surface water flood risk is a general problem for the Solway Tweed catchment area due to reasons such as run-off from fields and roads or due to insufficient capacity of sewers and drains. The flood risk from groundwater and sewer flooding in the Solway Tweed area is deemed low due to the issues being localised. Reservoir flood risk poses a threat to downstream areas within the Solway Tweed.</p> <p>The North West RBD covers an area of approximately 13,200km² and is occupied by close to seven million people. More than 370,000 of these people being at risk from flooding by rivers and the sea with a further 600,000 people at risk of surface water flooding. Around 35,000 people are thought to be living in areas that are deemed high risk of flooding from surface water with a further 97,500 at a moderate risk. 31,000 people are living in areas at are high risk of flooding due to rivers and the sea with a further 46,500 at a moderate risk. Areas of significant flood risk across the North West include Ambleside, Ashton under Lyne, Atherton, Blackburn, Burnley, Ellesmere Port, Formby, High Folds, Kendal and Liverpool.</p>

Management plan	Overview	Key aspects for the Waver Wampool catchment
<p>Shoreline Management Plan (SMP) ^[6]</p> <p>Owner: North West and North Wales Coastal Group</p>	<p>The SMP is a non-statutory, high level policy document for coastal flood and erosion risk management planning that was formally adopted in August 2016. It provides a large-scale assessment of the risks associated with coastal processes and helps to reduce these risks to people and the environment by identifying the most sustainable policies for managing flood and coastal erosion risks in the short term (0–20 years), medium term (20–50 years) and long term (50–100 years).</p>	<p>The long term plan for Morecambe Bay is to allow the shoreline to retreat where appropriate, so allowing the sea to return to low lying areas to create saltmarsh as sea levels rise.</p> <p>A managed realignment policy has been recommended for the majority of areas within Morecambe Bay to allow organisations, local land owners and responsible bodies to put in place measures to proactively adapt to future coastal changes.</p>
<p>Surface Water Management Plan (SWMP) ^[7]</p> <p>Owner: Lead Local Flood Authority (LLFA)</p>	<p>A SWMP is a plan which outlines the preferred surface water strategy for a location. Although owned and led by the LLFA, a SWMP is produced in collaboration with other drainage owners, water companies included.</p> <p>Partners work together to understand the surface water flood risk in an area and agree an approach to address these issues innovatively and in a cost-effective way, and where appropriate, in partnership. A SWMP is a long-term plan and should influence development.</p> <p>The decision on whether a SWMP is appropriate is down to the LLFA, generally they are produced for areas considered to experience a high flood risk. UUW continues to work closely with LLFAs and supports the development of SWMPs where required, and the delivery of SWMPs where they are published.</p>	
<p>Catchment Based Approach (CaBA) Catchment Plan ^[8]</p> <p>Owner: West Cumbria Catchment Partnership</p>	<p>The aim of the partnership is to bring together stakeholders to create and deliver a focussed, sustainable and collaborative action plan to deliver benefits within the catchment.</p>	<p>The aim of the catchment partnership is to:</p> <ul style="list-style-type: none"> • Improve water quality of the catchment by reducing diffuse pollution and wastewater inputs • Reduce the impacts due to flooding, droughts and coastal erosion • Increase resilience to climate change • Provide high quality, diverse and connected habitats, and to control invasive species • Increase opportunities for communities • Reverse redundant modifications and to allow for more natural flow • Help farm businesses to adopt more sustainable practices. <p>Current challenges include water quality, lack of habitat diversity and flood risk, particularly in Wigton.</p>

2.1 Strategic Planning Group (SPG)

We appreciate that there are many organisations with formal roles and responsibilities relating to drainage, flooding and protection of the environment. By participating in the creation of a DWMP much more can be achieved compared to working on our plans in isolation.

Within DWMP, SPGs have been a key form of engagement with stakeholders across the region. SPGs have operated at a local, catchment scale to allow stakeholders to input into the identification of priority and shared risk locations, and develop an understanding of potential collaborative solutions to tackle shared risks. The SPGs have covered a wide range of issues including reducing flooding and improving water quality. A key driver is understanding where there may be potential to achieve multiple benefit through solutions.

Through the SPGs, we have been able to consult with strategic partners on the various stages of the DWMP (Figure 4) and share outputs as and when they become available. This has been a two-way process and stakeholders have had the opportunity to share information with us such as action plans, confirmed projects, priority areas and ambitions for the future which could be developed and delivered in partnership. We have been able to review and incorporate the information shared during the different stages of the DWMP process.

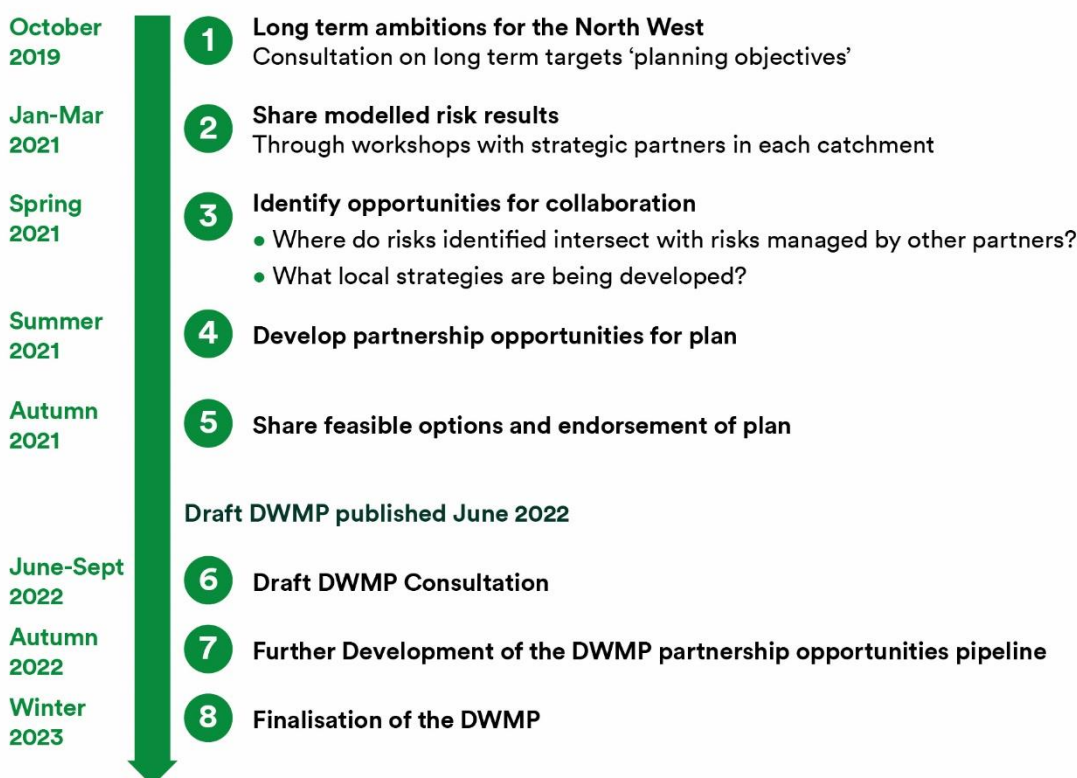
Within the Waver Wampool catchment, we have engaged with stakeholders such as:

- The Environment Agency;
- Cumbria County Council; and
- West Cumbria Rivers Trust (host of the West Cumbria Catchment Based Approach (CaBA) partnership).

More information on co-creation activity undertaken with the SPG can be found in Technical Appendix 2 - Stakeholder Engagement (TA2). The outputs from this activity in the Waver Wampool catchment are outlined in section 4.1.

Figure 4 DWMP framework for engagement

A framework for engagement in the North West



3. Risk identification

A key component of the DWMP has been around risk identification. This has been a mixture of both historical risk and forecast risk. Activities to understand this were completed through the Risk Based Catchment Screening (RBCS) and Baseline Risk and Vulnerability Assessment (BRAVA) stages. We have also undertaken numerous additional assessments to understand wider resilience and catchment risks.

Further detail on the approaches can be found in Technical Appendix 4 - Risk Based Catchment Screening (TA4) and Technical Appendix 5 - Understanding Future Risk (TA5).

3.1 Risk Based Catchment Screening (RBCS) and Horizon Scan

The RBCS stage is a series of high-level assessments that are used to review and screen each TPU to determine whether a more detailed assessment is required during the Baseline Risk and Vulnerability Assessment (BRAVA) stage.

The assessments are designed to span the key aspects of a wastewater company's responsibilities: from the network, to the treatment works, to its interaction with the environment. Examples of the assessments considered are internal sewer flooding, storm overflow performance, and pollution incidents. The assessments typically used three to five years of historical data.

Additional assessments termed 'horizon scanning' were undertaken to understand wider exogenous factors and opportunities that could inform future investment e.g. major infrastructure projects, private septic tank locations and potential major infrastructure projects (HS2 etc). Areas with potential future developments were also considered and further information on projected growth areas can be found within the associated Local Plans.

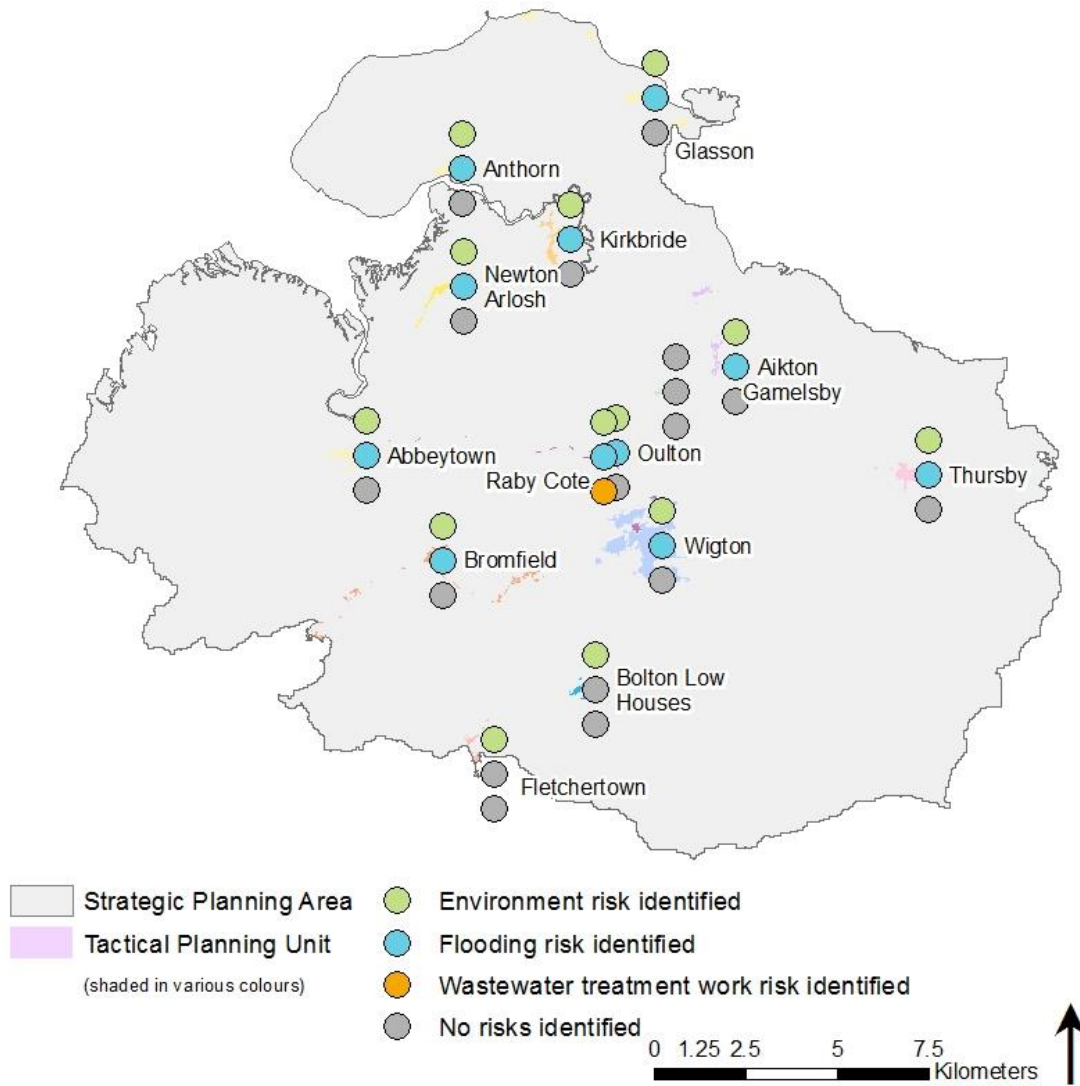
Within the Waver Wampool catchment, the RBCS stage identified 13 out of 14 TPUs that required further investigation and therefore passed onto the BRAVA stage (outlined in section 3.2).

Figure 5 indicates which of the RBCS categories (environmental, flooding and wastewater treatment works capacity) have triggered within each TPU. Environmental and flooding categories are the most common within the Waver Wampool, which is supported by the highest triggered RBCS assessments which are:

- Storm Overflow Assessment Framework - (13/14) – Environment; and
- External Sewer Flooding - (11/14) – Flooding.

Further detail on the approaches and assessment results can be found in Technical Appendix 4 (Risk Based Catchment Screening).

Figure 5 Map of the RBCS results for the Waver Wampool. Risk categories indicate areas triggering further investigation following RBCS



3.2 Baseline Risk and Vulnerability Assessment (BRAVA) and Resilience

The TPUs that were identified during RBCS were then taken forward into BRAVA, which aims to assess the baseline and future position of system performance against the DWMP planning objectives, to understand where there may be issues. It is also to understand wider resilience issues that could also impact upon the DWMP planning objectives. This stage considers risk at 2020, 2030 and 2050 design horizons.

In addition to BRAVA, a range of resilience assessments were undertaken and will have been incorporated throughout the plan to allow us to expand our understanding of wider core risks, such as how the water quality of rivers may change as a result of climate change. We have also assessed risks such as fluvial and/or coastal flooding and fluvial and/or coastal erosion and land stability.

Further detail on the approaches and assessment results can be found in TA5 and Technical Appendix 6 – Resilience (TA6).

The BRAVA and resilience results for the Waver Wampool catchment are outlined in Table 2 to Table 5.

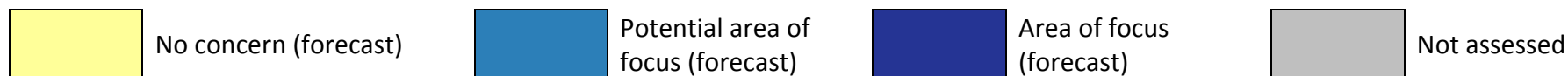
Table 2 Environmental BRAVA results

Tactical Planning Unit	Environmental					
	Pollution Assessment	Storm Overflow Performance		Bathing and Shellfish Spill Assessment		
	2020	2020	2050	2020	2030	2050
Abbeytown	Area of focus (forecast)	Potential area of focus (forecast)	Potential area of focus (forecast)	Not assessed / Not applicable	Not assessed / Not applicable	Not assessed / Not applicable
Aikton	Potential area of focus (forecast)	Not assessed / Not applicable	Not assessed / Not applicable	Not assessed / Not applicable	Not assessed / Not applicable	Not assessed / Not applicable
Anthorn	Area of focus (forecast)	Area of focus (forecast)	Area of focus (forecast)	Not assessed / Not applicable	Not assessed / Not applicable	Not assessed / Not applicable
Bolton Low Houses	Area of focus (forecast)	Not assessed / Not applicable	Not assessed / Not applicable	Not assessed / Not applicable	Not assessed / Not applicable	Not assessed / Not applicable
Bromfield	Area of focus (forecast)	No concern (forecast)	No concern (forecast)	Not assessed / Not applicable	Not assessed / Not applicable	Not assessed / Not applicable
Fletchertown	Area of focus (forecast)	Not assessed / Not applicable	Not assessed / Not applicable	Not assessed / Not applicable	Not assessed / Not applicable	Not assessed / Not applicable
Glasson	Area of focus (forecast)	No concern (forecast)	No concern (forecast)	Not assessed / Not applicable	Not assessed / Not applicable	Not assessed / Not applicable
Kirkbride	Area of focus (forecast)	No concern (forecast)	No concern (forecast)	Not assessed / Not applicable	Not assessed / Not applicable	Not assessed / Not applicable
Newton Arlosh	Area of focus (forecast)	Potential area of focus (forecast)	Potential area of focus (forecast)	Not assessed / Not applicable	Not assessed / Not applicable	Not assessed / Not applicable
Oulton	No concern (forecast)	Area of focus (forecast)	Area of focus (forecast)	Not assessed / Not applicable	Not assessed / Not applicable	Not assessed / Not applicable
Thursby	Area of focus (forecast)	Area of focus (forecast)	Area of focus (forecast)	Not assessed / Not applicable	Not assessed / Not applicable	Not assessed / Not applicable
Wigton	Potential area of focus (forecast)	Area of focus (forecast)	Area of focus (forecast)	Not assessed / Not applicable	Not assessed / Not applicable	Not assessed / Not applicable

BRAVA	
No concern (forecast)	
Potential area of focus (forecast)	
Area of focus (forecast)	
Not assessed / Not applicable	

Table 3 Flooding BRAVA results

Key



Tactical Planning Unit	Flooding												
	Internal Flooding Risk			External Flooding Risk			Sewer Collapse Risk	Risk of flooding in a storm (1:50yr)		Flooding of open spaces			Blockage Assessment
	2020	2030	2050	2020	2030	2050	2020	2020	2050	2020	2030	2050	2020
Abbeytown	Blue	Blue	Dark Blue	Blue	Blue	Blue	Dark Blue	Yellow	Yellow	Dark Blue	Dark Blue	Dark Blue	Dark Blue
Aikton	Blue	Blue	Blue	Yellow	Yellow	Yellow	Blue	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Anthorn	Blue	Blue	Blue	Blue	Dark Blue	Dark Blue	Yellow	Dark Blue	Dark Blue	Blue	Dark Blue	Dark Blue	Yellow
Bolton Low Houses	Grey	Grey	Grey	Grey	Grey	Grey	Dark Blue	Grey	Grey	Grey	Grey	Grey	Yellow
Bromfield	Blue	Blue	Blue	Dark Blue	Dark Blue	Dark Blue	Yellow	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Yellow
Fletchertown	Grey	Grey	Grey	Grey	Grey	Grey	Dark Blue	Grey	Grey	Grey	Grey	Grey	Yellow
Glasson	Blue	Blue	Blue	Yellow	Yellow	Dark Blue	Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Yellow
Kirkbride	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Yellow
Newton Arlosh	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Yellow	Blue	Blue	Dark Blue	Dark Blue	Dark Blue	Yellow
Oulton	Dark Blue	Dark Blue	Dark Blue	Yellow	Yellow	Dark Blue	Dark Blue	Yellow	Yellow	Dark Blue	Dark Blue	Dark Blue	Yellow
Thursby	Dark Blue	Dark Blue	Dark Blue	Yellow	Blue	Dark Blue	Yellow	Blue	Dark Blue	Dark Blue	Dark Blue	Dark Blue	Yellow
Wigton	Blue	Blue	Blue	Yellow	Yellow	Blue	Yellow	Yellow	Yellow	Dark Blue	Dark Blue	Dark Blue	Yellow

Table 4 Wastewater treatment works BRAVA results

Tactical Planning Unit	Wastewater Treatment Works		
	Risk of wastewater treatment works (WwTW) capacity		
	2020	2030	2050
Aikton			
Glasson			
Kirkbride			
Thursby			
Wigton			

BRAVA	
	No concern (forecast)
	Potential area of focus (forecast)
	Area of focus (forecast)
	Not assessed / Not applicable

Table 5 Environmental and flooding resilience results

Tactical Planning Unit	Resilience Assessment		
	Environmental		Flooding
	Potential for changes in the water quality of rivers as a result of climate change	Potential for changes in catchment contributions as a result of climate change	Outfall locking
	2050	2050	2020
Abbeytown	More resilient	More resilient	Not assessed
Bolton Low Houses	Less resilient	Less resilient	Not assessed
Bromfield	Less resilient	Less resilient	Not assessed
Fletchertown	Less resilient	Less resilient	Not assessed
Gamelsby	Less resilient	More resilient	Not assessed
Oulton	Less resilient	Less resilient	Not assessed
Thursby	More resilient	More resilient	Not assessed
Wigton	Less resilient	More resilient	Less resilient

Resilience	
More resilient	More resilient
Less resilient	Less resilient
Not assessed	Not assessed

3.3 Problem characterisation

3.3.1 Complex catchment

Complex catchments were determined through problem characterisation using a combination of a complex and strategic catchment scores based on strategic need (largely derived from growth and climate forecast models) and modelled risks in each of the TPU (largely based on BRAVA). Within the Waver Wampool, no TPUs were identified to be 'complex' based on problem characterisation.

3.3.2 Strategic growth catchments

Through the various risk identification assessments, a number of locations were identified through opportunity workshops that require more strategic analysis. These are areas with high growth, a high number of risks and multiple potential scenarios. Different bespoke scenarios are applied to strategic catchments based on the needs and drivers of the catchments to understand the variability of risk as a first step for optioneering, so that the range of options developed can mitigate a different range of scenarios.

There are no TPUs within the Waver Wampool catchment that were identified as having 'strategic growth'.

4. Options development

The approach for options development is an iterative screening process to identify most appropriate solutions for issues in each TPU. These solutions were taken forward for a best value assessment which will select the preferred option (Figure 6).

An options hierarchy was then used which has been endorsed by customers and stakeholders from across the North West to select preferred solutions (Figure 7). The hierarchy covers a range of option types from behavioural, to blue-green solutions e.g. SuDS and traditional grey solutions e.g. storage tanks across benefits such as reducing demand, better system management and creating capacity.

A key element to this has been built around co-development, co-funding and co-delivery through partnerships and third parties (for instances where a specific skill set is required).

Figure 6 Options development process

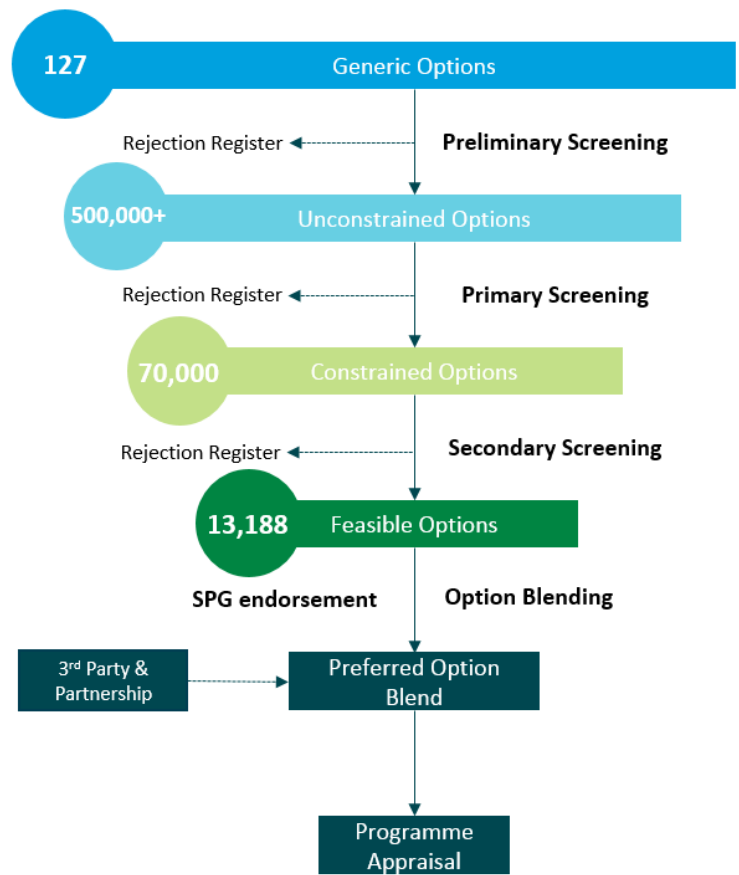
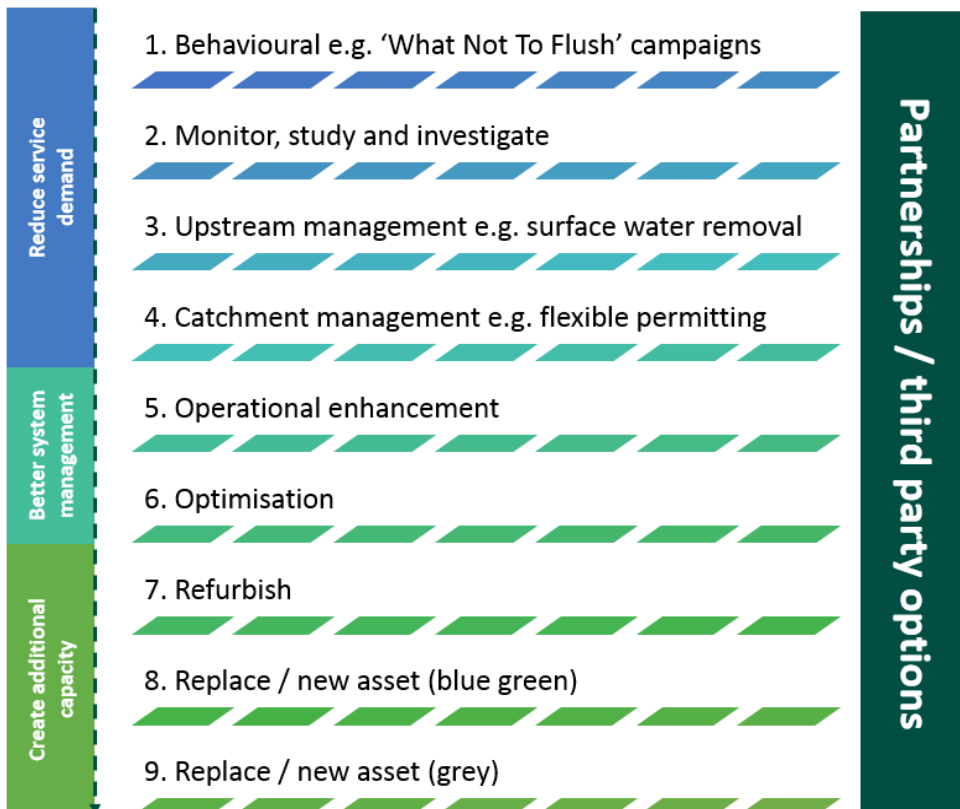


Figure 7 Options hierarchy



4.1 Waver Wampool partnership opportunities

In order to identify and develop potential partnership options in the Waver Wampool, through the SPG we have shared the results from the risk identification stages such as BRAVA. This was done through a series of workshops and the purpose was to identify areas of shared risk and partnership opportunities.

The DWMP Partnership Opportunities Pipeline (PoP) was consequently created using the outputs of this engagement. The pipeline includes opportunities at a range of different levels of maturity and confidence in development, as such these are not confirmed or funded schemes at this time. However, they provide an indication of areas where we may be able to work collaboratively with stakeholders in the future when more certainty is available on need and funding.

From the initial suggestions made during the SPG workshops, the DWMP PoP has undergone various refinements as summarised below:

- Where possible, the potential partnership opportunities were mapped and this created over 1,000 opportunities for further investigation. The suggestions were screened depending on the opportunities timescales, proximity to UUW assets and the level of detail. This allowed UUW to refine the opportunities, which were believed to have the most potential;
- This refined list was presented back to the SPGs for updates, review and discussion. This further discussion allowed additional benefits to be identified and better mapping. This was particularly important for potential integrated drainage partnership opportunities as it helps to understand the holistic picture of the flooding mechanism. This refined the list further to approximately 500 potential partnership opportunities;
- Following the SPG events, we mapped the updated DWMP partnership opportunities against asset locations and UUW areas of interest e.g. flooding clusters and mutual natural flood management, to identify those most suited to the DWMP. This produced the list of key DWMP partnership opportunities; and
- The key list of opportunities have been reviewed against the wider DWMP options development process.

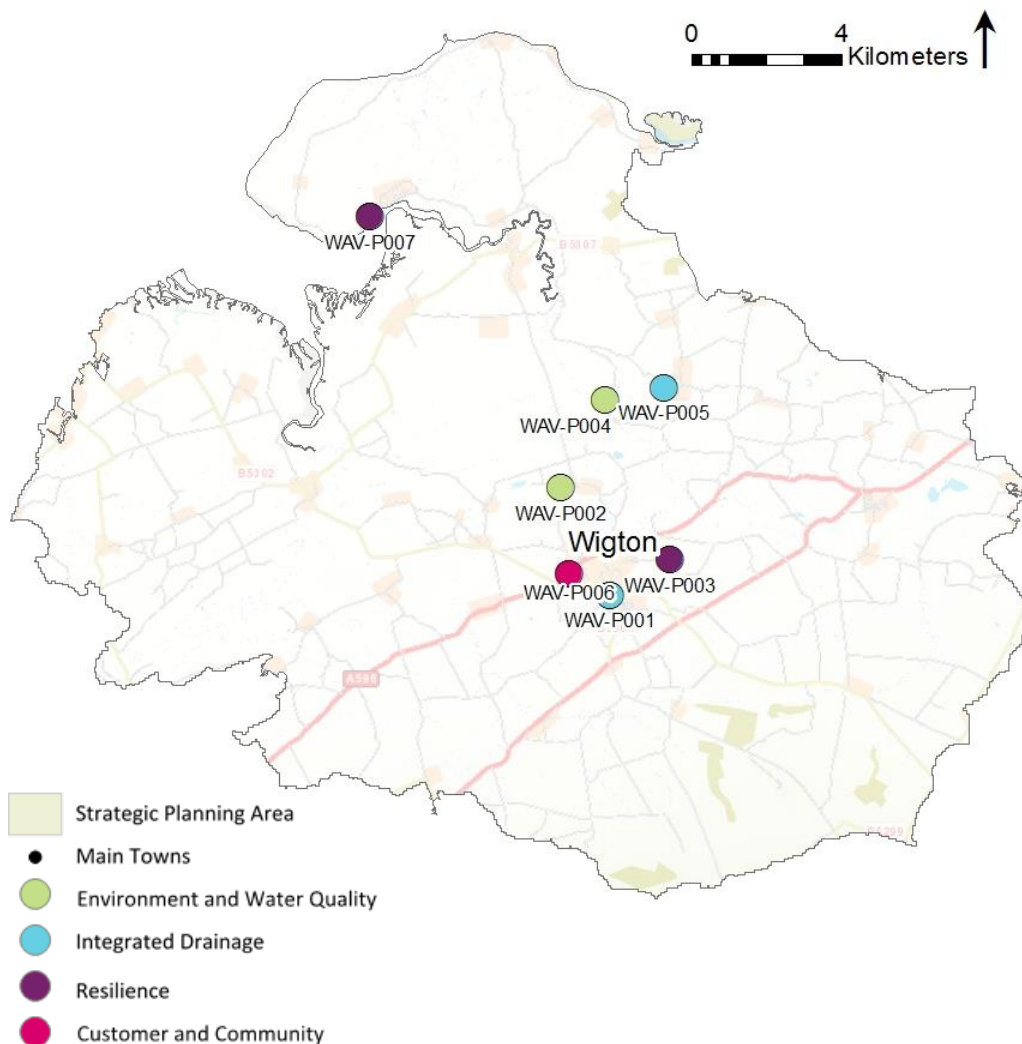
The remaining opportunities that did not make it into the key DWMP PoP, for example in areas with no wastewater assets, were captured in our organisation-wide partnership opportunity pipeline where they are considered alongside all other partnership opportunities. Another key reasons for opportunities not being included in the DWMP PoP is where projects may be more imminent as the DWMP is a longer-term plan.

Examples of potential partnership opportunities that were shared during the Waver Wampool SPG workshops are shown in Figure 8.

We are further developing the organisation-wide partnership opportunity pipeline and are developing a central partnership prioritisation process which comprises of two elements; the partnership solution identification stage and a specific partnership assessment activity which aims to support decision making for partnership schemes against a set of specific criteria. This will allow UUW to harness scheme specific collaboration opportunities as we recognise the need for more strategic partnerships, and we will build on successes from historic partnerships in the North West.

For further information on our approach to partnership working, refer to TA2.

Figure 8 Overview of the potential partnership opportunities in the Waver Wampool



ID	Partnership Opportunity	Theme	Organisation Type
WAV-P001	Drainage management project	Integrated Drainage	Non-Governmental Organisations
WAV-P002	Water quality improvements project	Environment and Water Quality	Non-Governmental Organisations
WAV-P003	Natural flood management project	Resilience	Public Bodies
WAV-P004	Water quality improvements project	Environment and Water Quality	Public Bodies
WAV-P005	Surface water management project	Integrated Drainage	Private Sector
WAV-P006	Community outreach project	Customer and Community	Private Sector
WAV-P007	Natural flood management project	Resilience	Local Councils and Planning Authorities

Note: The above are suggestions made by stakeholders but not all of them meet DWMP criteria for potential partnership working. Suggestions made that do not meet DWMP criteria have been added to UUW companywide partnership pipeline for further consideration.

5. Options for the Waver Wampool

The DWMP's purpose is to provide a long-term view of potential interventions and opportunities up to 2050. We acknowledge that planning this far in the future can be uncertain. This is why it is important that the DWMP is also aligned with nearer term activities which could influence and change the trajectory of future risks and opportunities.

The success of the DWMP through investment across the North West will depend on continued and new partnership working which is at the heart of both the DWMP, and the development of the business plan for investment cycle 2025 – 2030 (also known as AMP8). We are aligned to ensure that decisions made support the continued growth of the North West for customers and communities, and allow the environment to thrive for future generations.

This section provides a high level overview of the potential benefits and investment that can be delivered across the North West through key activities such as the Water Industry National Environment Programme (WINEP) for investment cycle 2025 – 2030, longer-term measures identified through the DWMP, and other projects such as Better Rivers: Better North West which is our commitment to improving river health.

5.1 WINEP development

Note: At the time of DWMP publication, the WINEP was not confirmed by regulators so is likely to change. The WINEP data presented below aligns to the formal submission from U UW in January 2023.

The WINEP is a programme of works that is jointly developed between water companies and regulators to meet statutory requirements and deliver environmental improvements to customers and communities. It sets out how the water industry will contribute to improving the natural environment.

The water industry has undertaken significant investment in the last three decades to improve the water environment and thus aquatic life. The WINEP drives the largest investment programme in the water environment nationally. For investment cycle 2020 to 2025, it includes activities such as asset improvements, investigations, monitoring and catchment interventions.

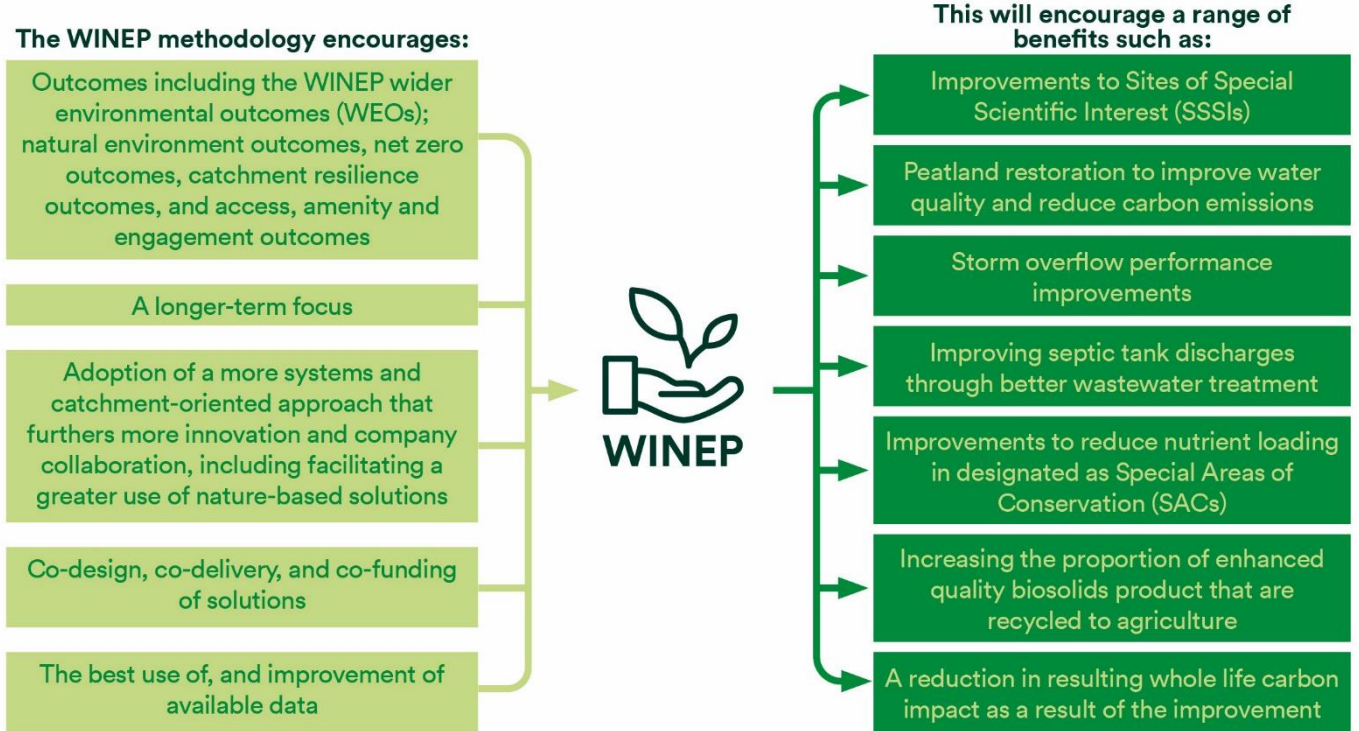
The next WINEP for investment cycle 2025 – 2030 (AMP8) is still to be confirmed (after the publication of the DWMP) and you will be able to find out more about what this means for the Waver Wampool when we publish our AMP8 submission in autumn 2023.

Moving forwards, there is a collective ambition for the WINEP to deliver even more for the environment, for customers and for communities. This reflects society's high expectations and the UK government's ambition to leave the environment in a better state for the next generation.

As part of this, a large portion of the WINEP for the next investment cycle (2025 – 2030) aims to improve storm overflow performance. The programme has been designed to meet the Government's Storm Overflow Discharge Reduction Plan (SODRP) trajectory targets, address proven harm where we have been able to identify the best value solution and then the remainder includes action at the most cost effective overflows to achieve a reduction in spill frequency to around 20 spills per annum average by 2030. Subsequent investment periods will see further reductions in line with the Government requirements. The scale of transition required to meet the SODRP targets means that U UW will be delivering substantial WINEP investment programmes for the next 25 years.

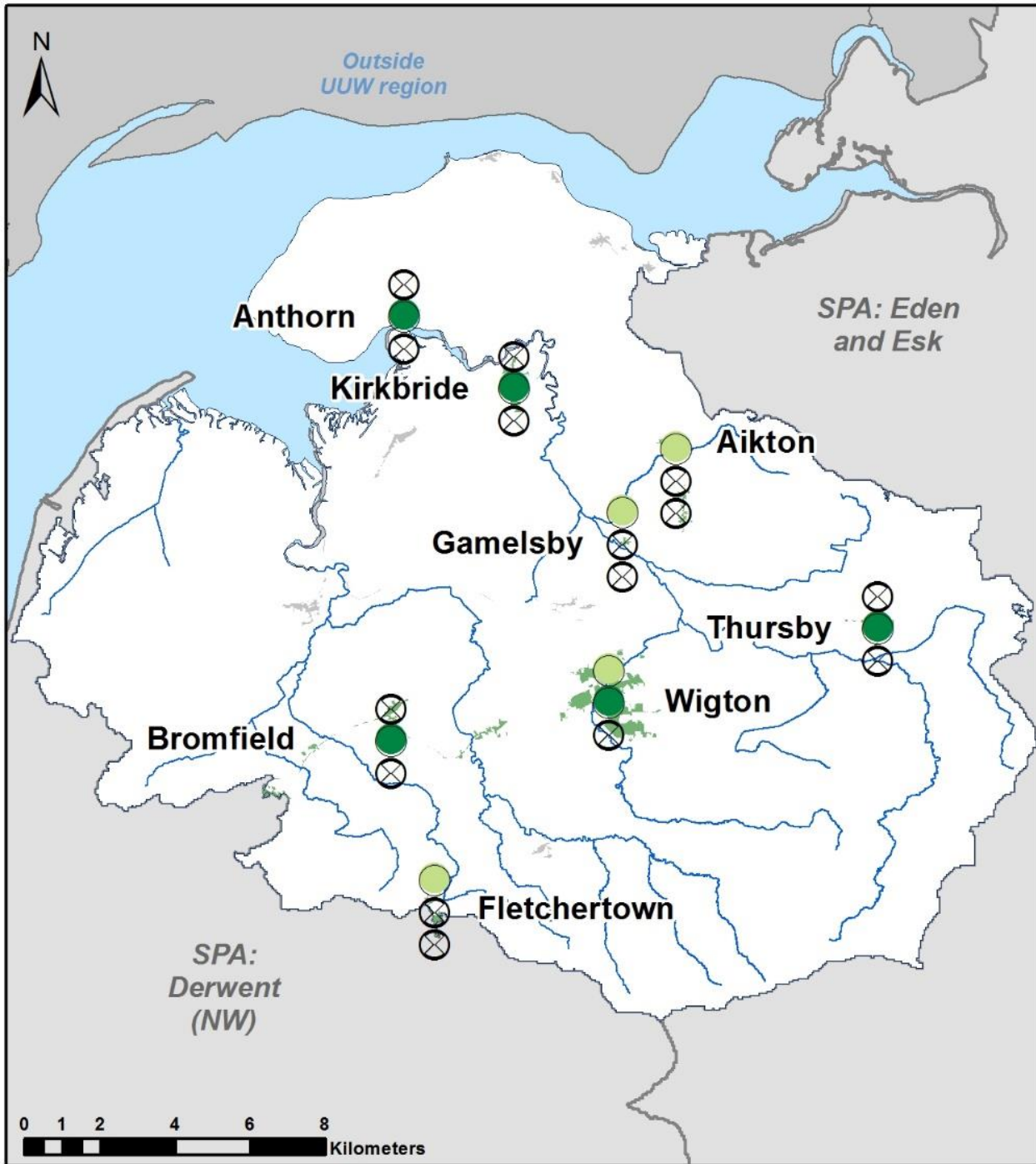
Figure 9 highlights some of the potential benefits as a result of the WINEP.

Figure 9 Potential benefits to the North West as a result of the WINEP



The WINEP will provide great opportunities to drive and deliver benefits across the North West region, and Figure 10 shows which locations within the Waver Wampool have the potential for investment cycle 2025 – 2030 WINEP schemes, based on the January 2023 WINEP submission.

Figure 10 Potential WINEP investment in the Waver Wampool for investment cycle 2025-2030



TPUs with WINEP driver investment



All potential WINEP interventions are subject to a regulatory decision making process that is ongoing at time of DWMP publication.

5.2 Options considered within the DWMP














As highlighted above, the delivery of the WINEP will drive improvements and deliver benefits across the North West in the nearer-term. The DWMP is closely aligned with the ambitions and targets included within the WINEP, and included below are potential further enhancement schemes to be delivered over the next 25-years as part of the DWMP.

The development of the DWMP has utilised various data sources across the different stages of the plan, such as risk identification and BRAVA, partnership opportunities, and option development. This has allowed us to understand what options and interventions could be introduced to mitigate shared risks and harness opportunities for collaboration. This aspect of the DWMP is known as preferred options and has been developed using a decision support tool and by following the option hierarchy. The preferred options are high-level potential interventions up to 2050.

The development of the DWMP preferred options followed an iterative screening processes (outlined in section 4) which have been grouped into option types as shown in Figure 11. There are three main categories which are:

- ‘Reducing Service Demand’ which focusses on either reducing the amount of wastewater that is produced, or preventing it from reaching the sewer network;
- ‘Better System Management’ which focusses on managing and operating the existing assets in a more efficient or effective manner; and
- ‘Create Additional Capacity’ which focusses on building new assets, for example storage tanks or new treatment work process units, where it is not possible or economical to reduce demand or improve operations any further.

Figure 11 Option types

Reduce Service Demand		Schools Education Programme
		Customer Engagement
		Surface Water Source Control Measures
		Modification of Permits
Better System Management		Intelligent Network Operation
		Enhanced Operational Maintenance
		Repair and Rehabilitation
Create Additional Capacity		New 'Green' WwTW Capacity (e.g. Reedbed)
		New 'Green' Overflow Treatment (e.g. Reedbed)
		Separation of Combined Sewers
		WwTW Transfers
		WwTW Improvement
		Construction of New Drainage Capacity

Potential opportunities for investment as part of the DWMP can be summarised as:

- Level 1: Regional measures (section 5.2.1);
- Level 2: Options for the Waver Wampool (section 5.2.2); and
- Level 3: Options for each location within the Waver Wampool (section 5.2.3).

Across these three levels, there are numerous opportunities over the next 25 years for continued and new partnerships in addition to new innovative technology.

The following sections provides an overview of the outputs from the DWMP. This includes all potential interventions that could be undertaken over the next 25-years to deliver benefit to the North West under the assumption of unconstrained funding. Therefore, it is likely that the interventions implemented will vary.

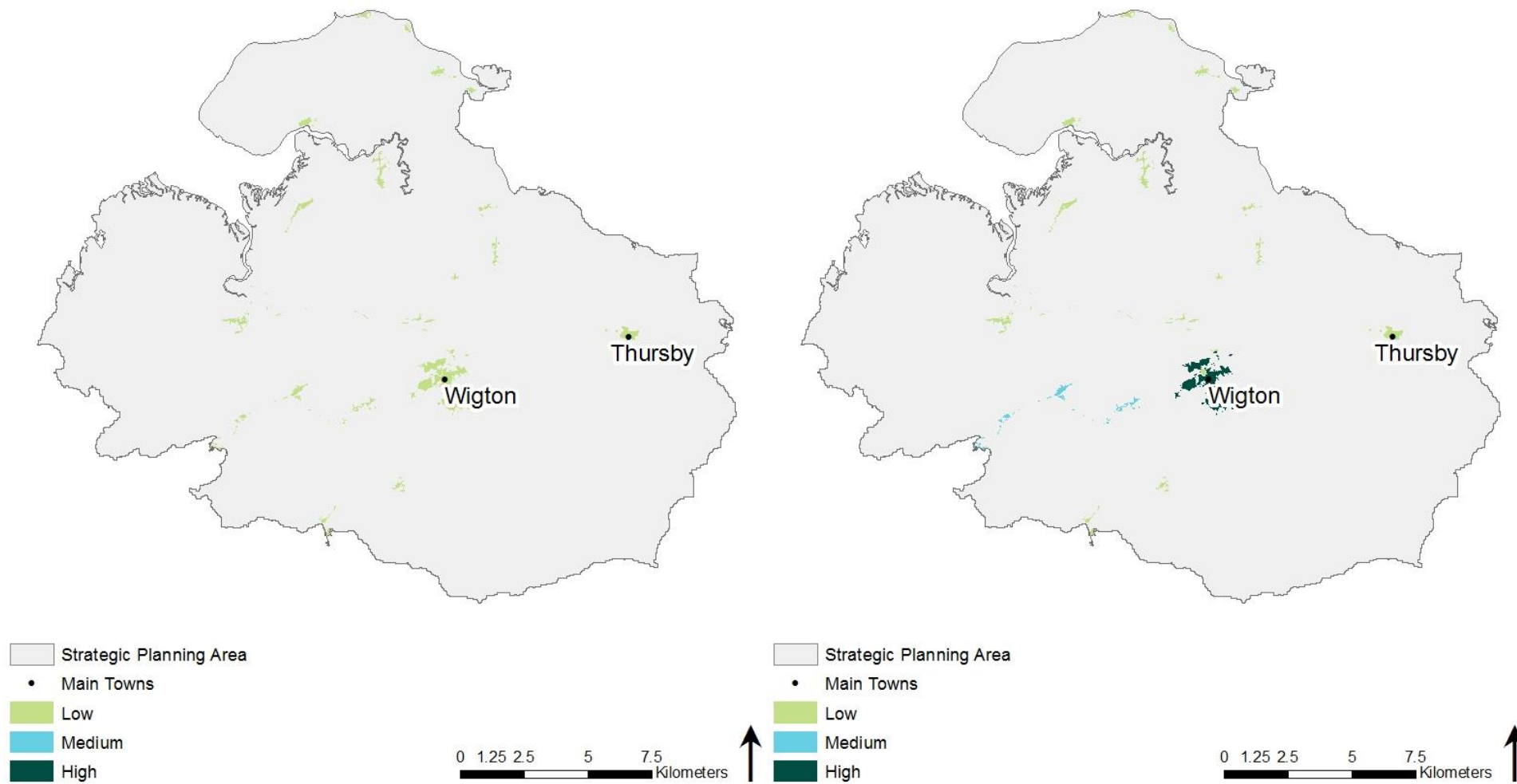
5.2.1 Level 1: Regional measures

Across the option types, a number can be considered regional options – those which could be implemented across the North West but may bring tangible benefits in some areas more than others. These can be investigated further ahead of investment cycle 2025 – 2030 where viable.

Across the Waver Wampool catchment customer engagement options (Figure 12) comprising of options to work with customers to reduce demand and increase awareness of ‘what not to flush’ have been identified as having the potential to deliver the highest benefit in Wigton TPU.

Sustainable Drainage System (SuDS) options have been assessed, these form a key part of the strategy to manage rainwater from entering the sewer system in Wigton and Oulton TPUs (Figure 12).

Figure 12 Maps show the benefit of implementing regional customer engagement (left) and sustainable drainage solutions (right) options across the Waver Wampool



5.2.2 Level 2: Options for the Waver Wampool

The DWMP preferred options can also be summarised as the potential investment and associated benefits across the Waver Wampool. These can be demonstrated by:

- The potential options to address environmental planning objectives as shown in Figure 13. This incorporates elements such as wastewater treatment work permit compliance, WINEP compliance and pollution of watercourses;
- The potential options to address flooding planning objectives as shown in Figure 14. This incorporates elements such as internal flooding, external flooding, highway and open space flooding and 1 in 50-year flooding; and
- The distribution of the potential options that could contribute to addressing the above planning objectives as shown in Figure 15.

Figure 13 Distribution of environmental investment by option type within the Waver Wampool

This is an example of how investment in different options types may be used to address the environmental planning objectives. The vast majority of potential investment could be through surface water source control measures (e.g. SUDS), improvements in wastewater treatment works, and construction of new drainage capacity.

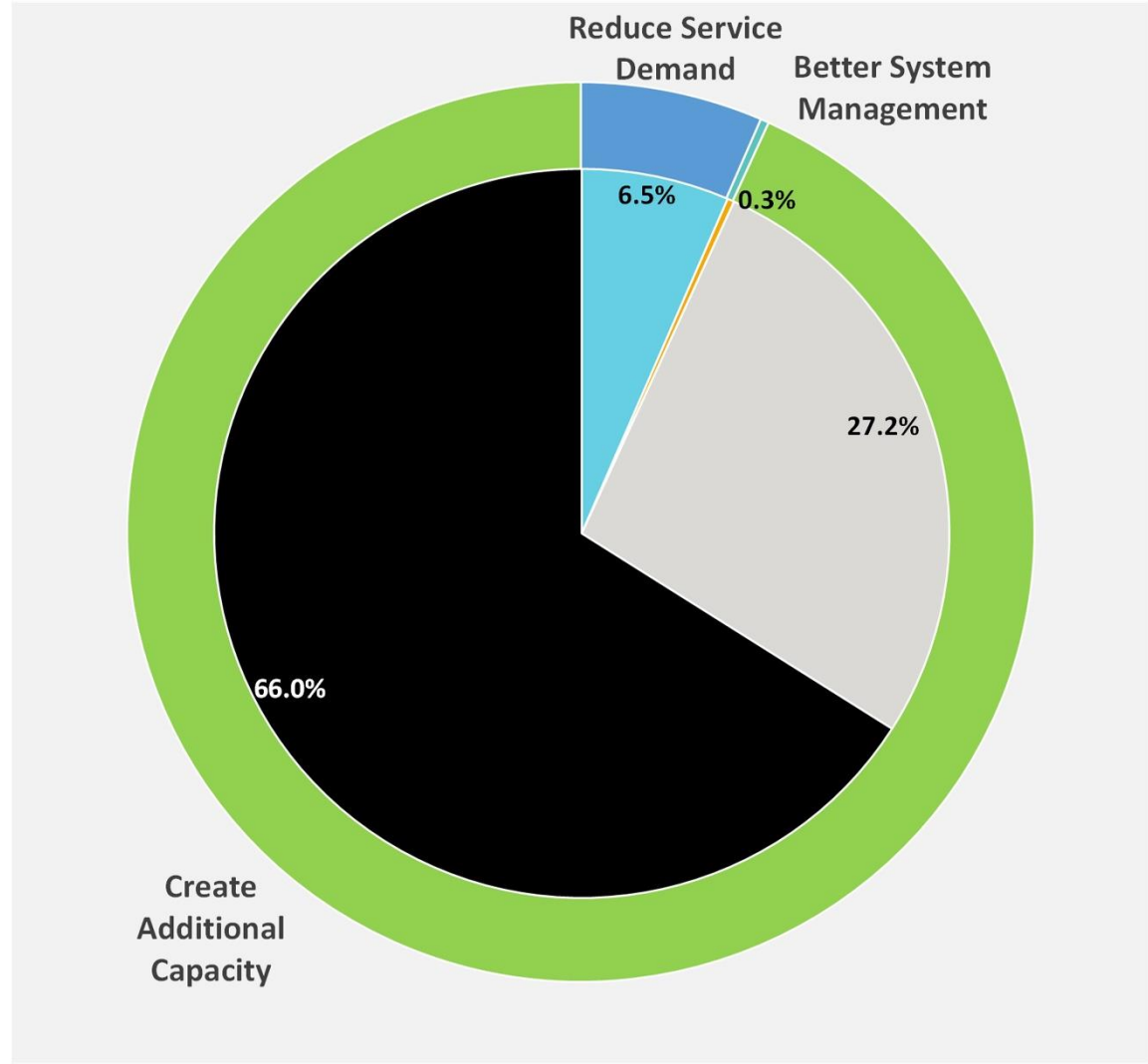


Figure 14 Distribution of flooding investment by option type within the Waver Wampool

This is an example of how different options types may be used to address flooding planning objectives. Around two thirds of the investment will be through a strategy to reduce demand on the sewer system, seen here through surface water source control measures such as SuDS and schools and customer engagement programmes.

3% of investment will be in improving existing system management, and 31% of the investment will be in construction of new stormwater storage capacity.

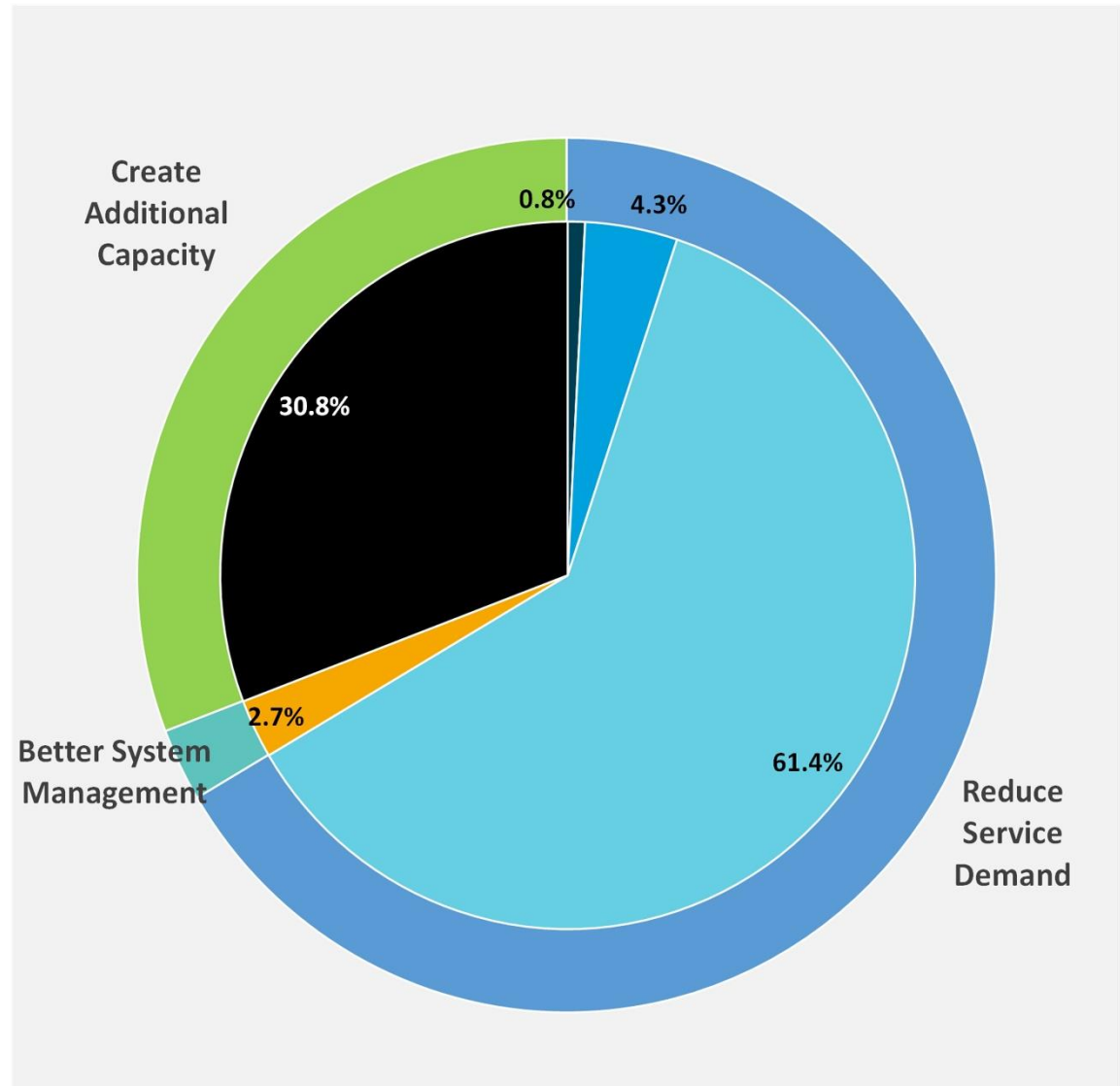
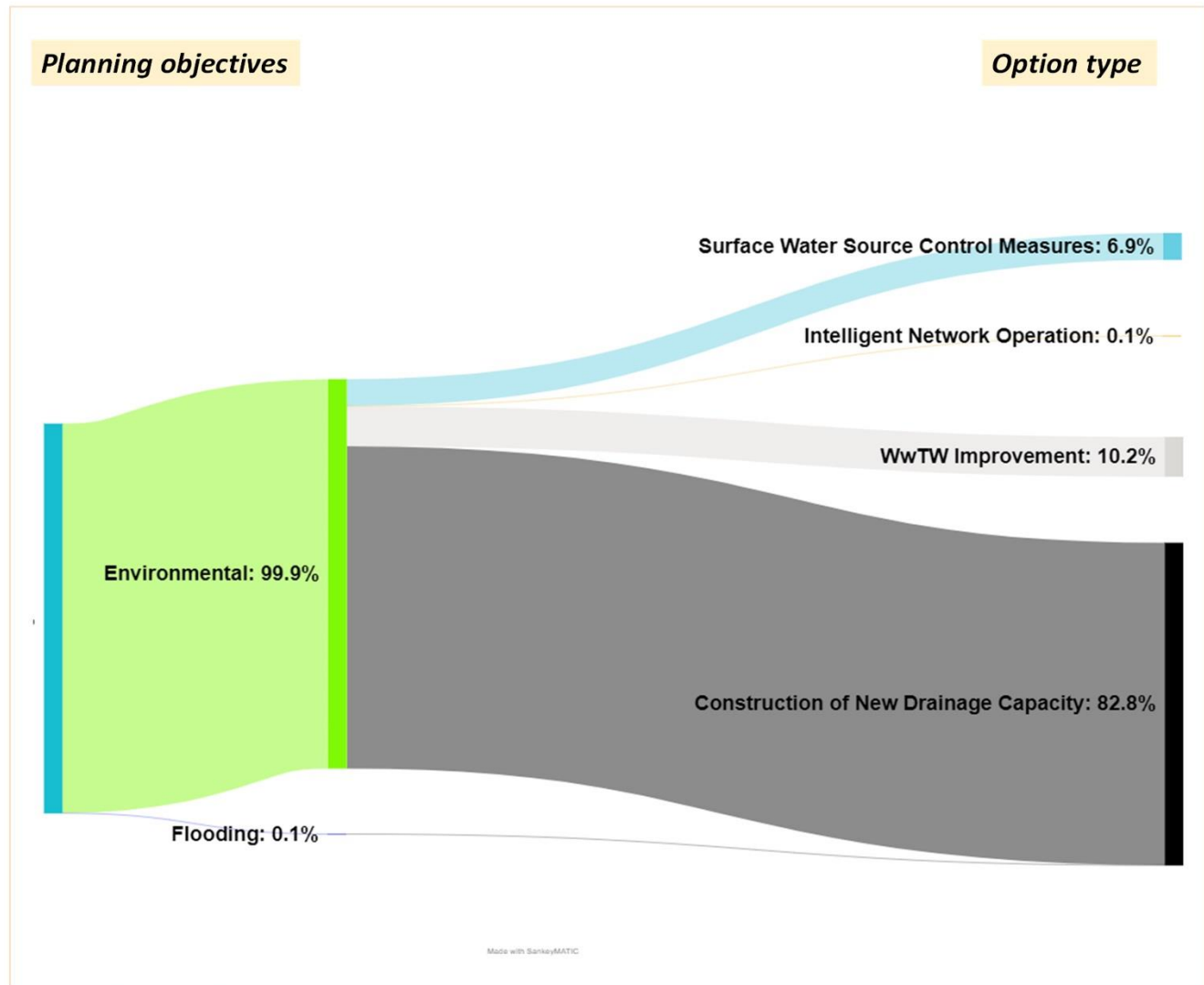
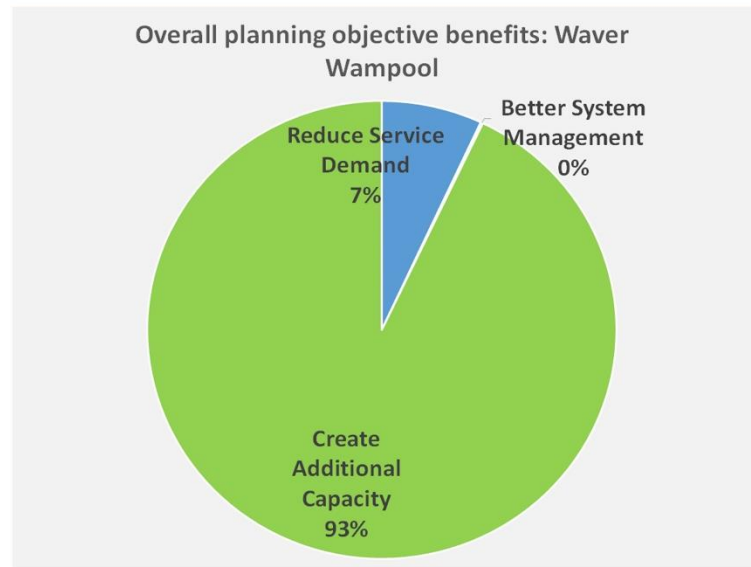


Figure 15 Distribution of benefit by option type within the Waver Wampool

This is an example of how different option types may be used to demonstrate potential benefits against different planning objectives within the Waver Wampool SPA.

United Utilities Water (Uuw) commitments to improving flooding performance could be met through the construction of new stormwater drainage capacity.

Environmental planning objectives could be met mainly through improvements to wastewater treatment works, improved operational maintenance systems, provision of stormwater storage capacity and through the reduction of surface water flows.

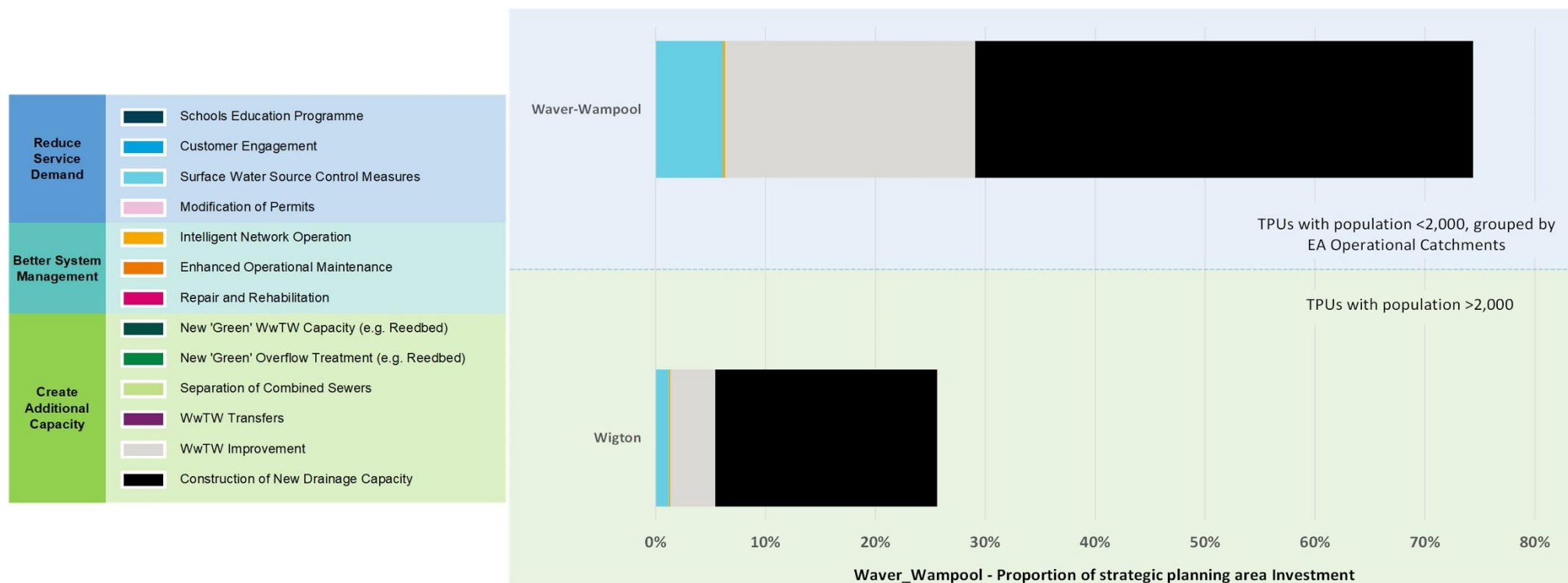


5.2.3 Level 3: Local options for each TPU within the Waver Wampool

The proportion of the Waver Wampool’s potential investment in each TPU, split up by option type, is shown in Figure 16. Note that the smaller TPUs within the catchment (those with less than 2,000 population) have been reported together at the top of the chart, grouped by sub catchment (Environment Agency Operational Catchment boundaries).

It can be seen that in the Waver Wampool, the largest TPU sees the largest potential investment, which is split predominantly between surface water control, improved system management, and construction of new storm water storage tanks.

Figure 16 Proportion of investment seen in each TPU within the Waver Wampool



The following sub-sections show how investment will be split between different types of options to bring benefits to each TPU over the short, medium and long term. Some options, such as construction of new storm water storage tanks, occur at a single point in time; however the benefit of reduced flooding may be seen long into the future. Other options such as school education, are continual programmes that could help to encourage long-term sustainable behaviours, such as reduction in water use.

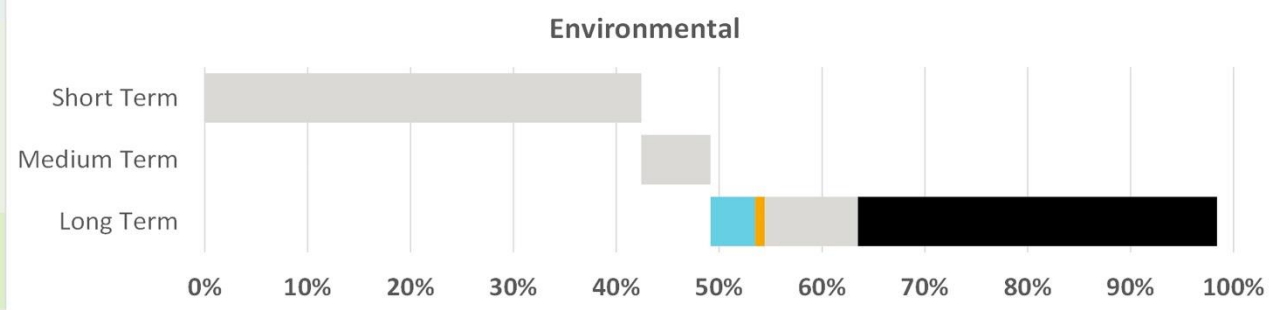
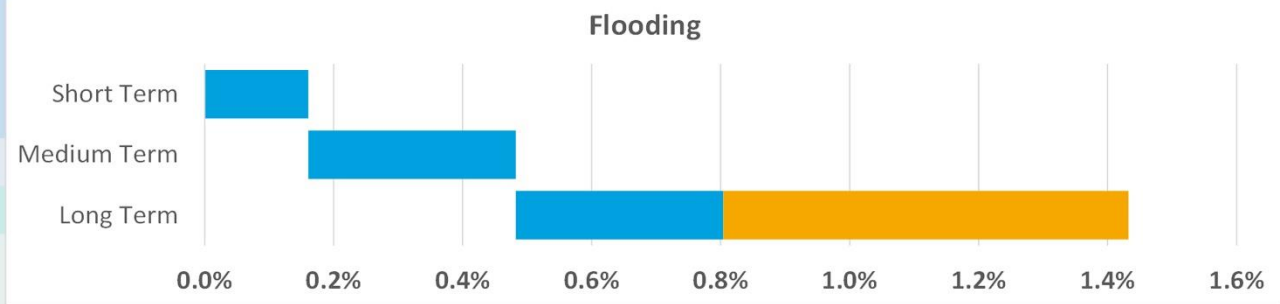
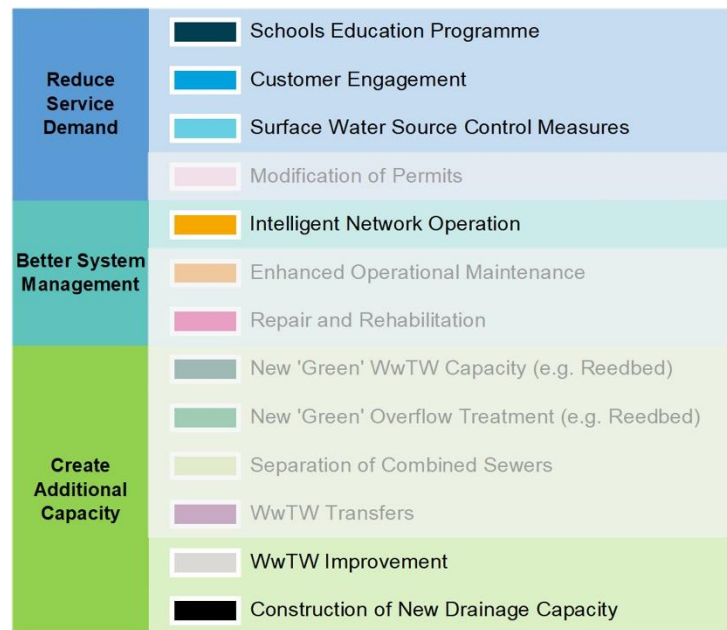
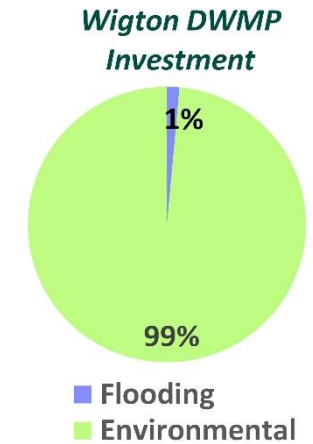
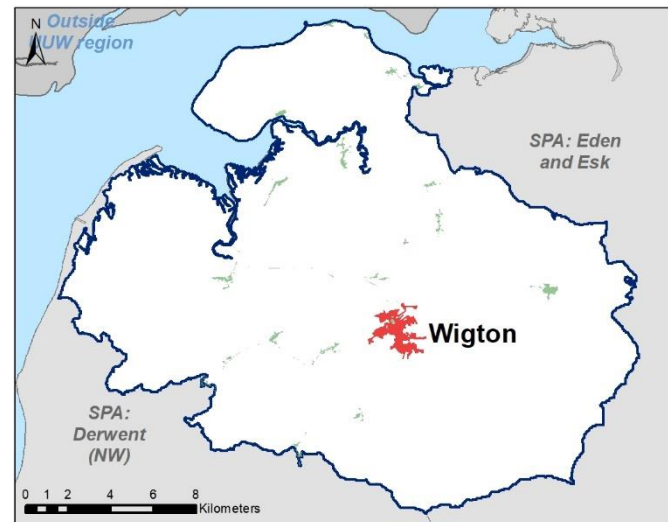
5.2.3.1 Wigton

Figure 17 Details of the DWMP investment plan for Wigton

The data on this page gives details of the investment plan for Wigton TPU. The plan shows the geographic location of Wigton within the Waver Wampool catchment.

The pie chart to the right of the plan indicates the percentage split of proposed flooding and environmental investment. Environmental investment includes work to address storm overflows, wastewater treatment works and pollution of watercourses.

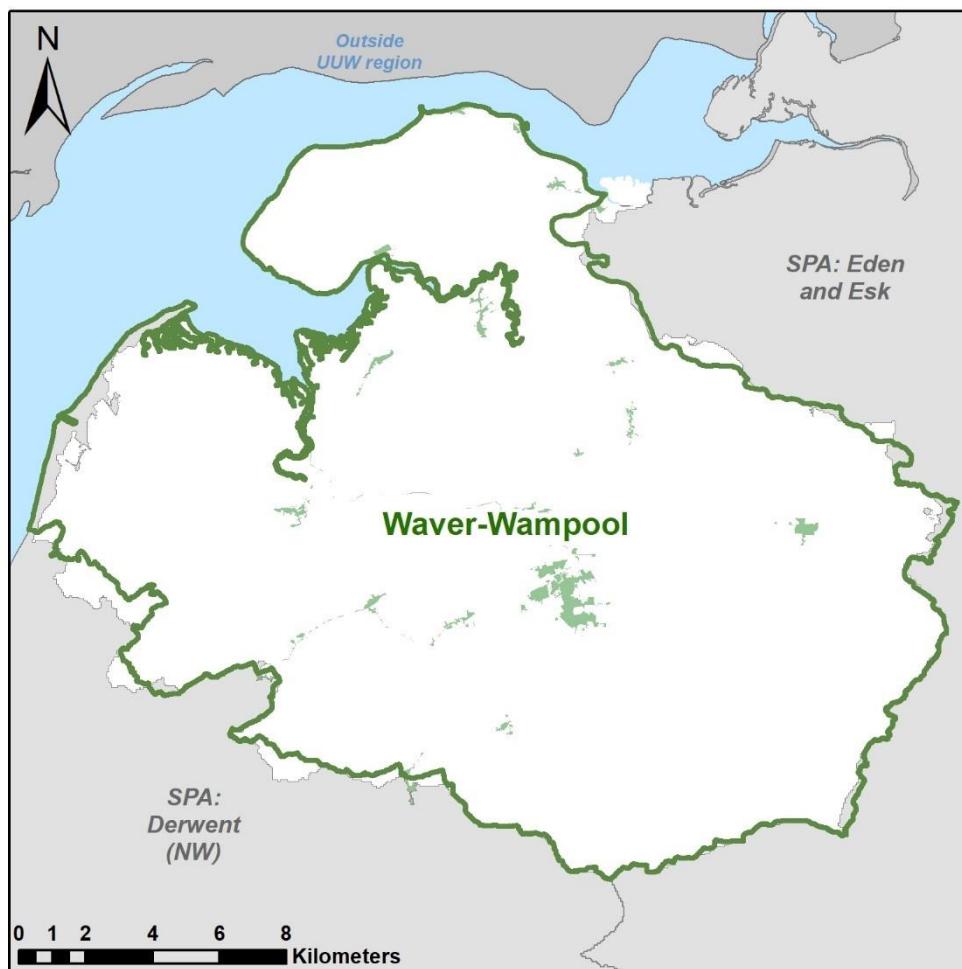
The bar charts below show a more detailed breakdown of the potential option types that make up the flooding and environmental investment. The key to the left of the bar charts show the colours used for the 13 different option types. Additionally, the charts indicate whether investments are proposed in the short, medium or long term.



5.2.4 TPUs with population less than 2,000

Within the Waver Wampool catchment, there are a number of small TPUs, each with a population of less than 2,000. For the purpose of reporting, these have been grouped together within Environment Agency operational catchment (OC) boundaries, which are sub-divisions of the overall SPA, aligned to local river systems. Within the Waver Wampool, there is one Environment Agency operational catchment area, which can be seen in Figure 18.

Figure 18 Location of Environment Agency operational catchments within Waver Wampool SPA



Environment Agency Operational Catchment	TPUs
Waver-Wampool	Abbeytown Aikton Anthorn Bolton Low Houses Bromfield Flechertown Gamelsby Glasson Kirkbride Newton Arlosh Oulton Raby Cote Thursby

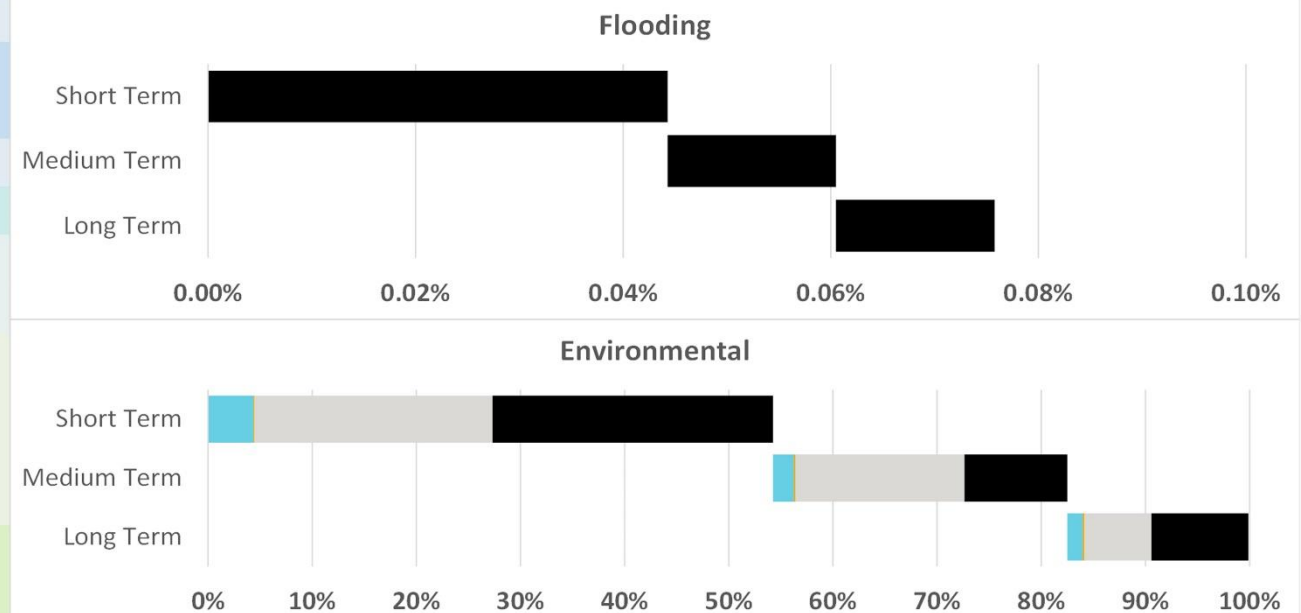
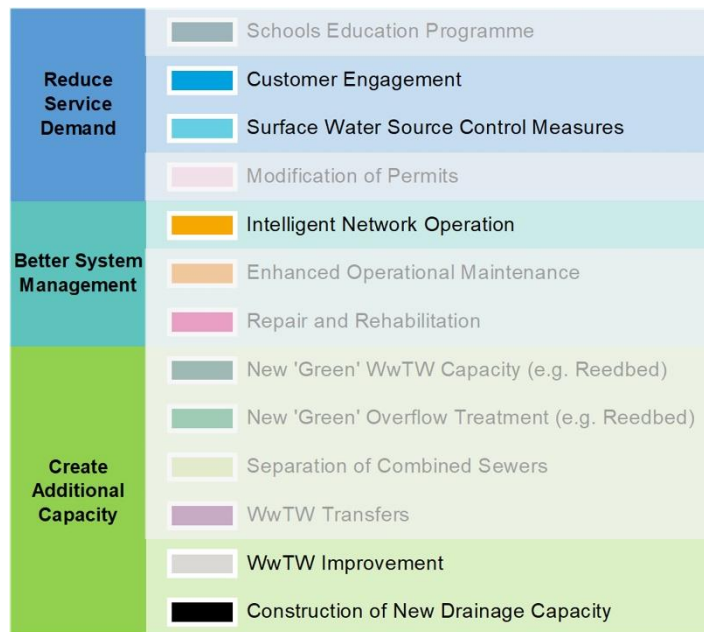
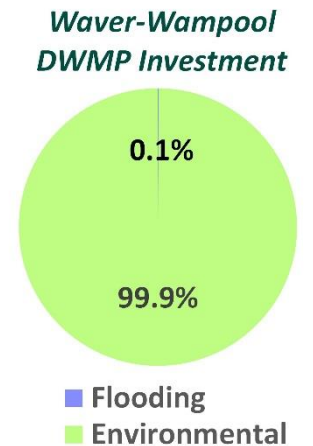
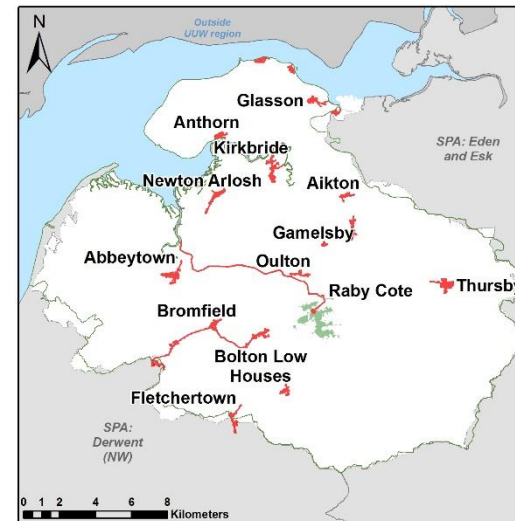
5.2.4.1 TPUs with population less than 2,000: Waver Wampool Operational Catchment (OC)

Figure 19 Details of the DWMP investment plan for the Waver Wampool OC

The data on this page gives details of the investment plan for the TPUs within the Waver Wampool OC. The plan shows the geographic location of these TPUs within the Waver Wampool OC.

The pie chart to the right of the plan indicates the percentage split of proposed flooding and environmental investment. Environmental investment includes work to address storm overflows, wastewater treatment works and pollution of watercourses.

The bar charts below show a more detailed breakdown of the potential option types that make up the flooding and environmental investment. The key to the left of the bar charts show the colours used for the 13 different option types. Additionally, the charts indicate whether investments are proposed in the short, medium or long term.



5.3 Other projects and investment

In addition to the improvements and benefits that the WINEP and the DWMP will drive in the years to come, there are also other projects that will help to achieve our ambitions. One of which is our Better Rivers: Better North West project which aims to improve the region’s river water quality.

5.3.1 Better Rivers: Better North West

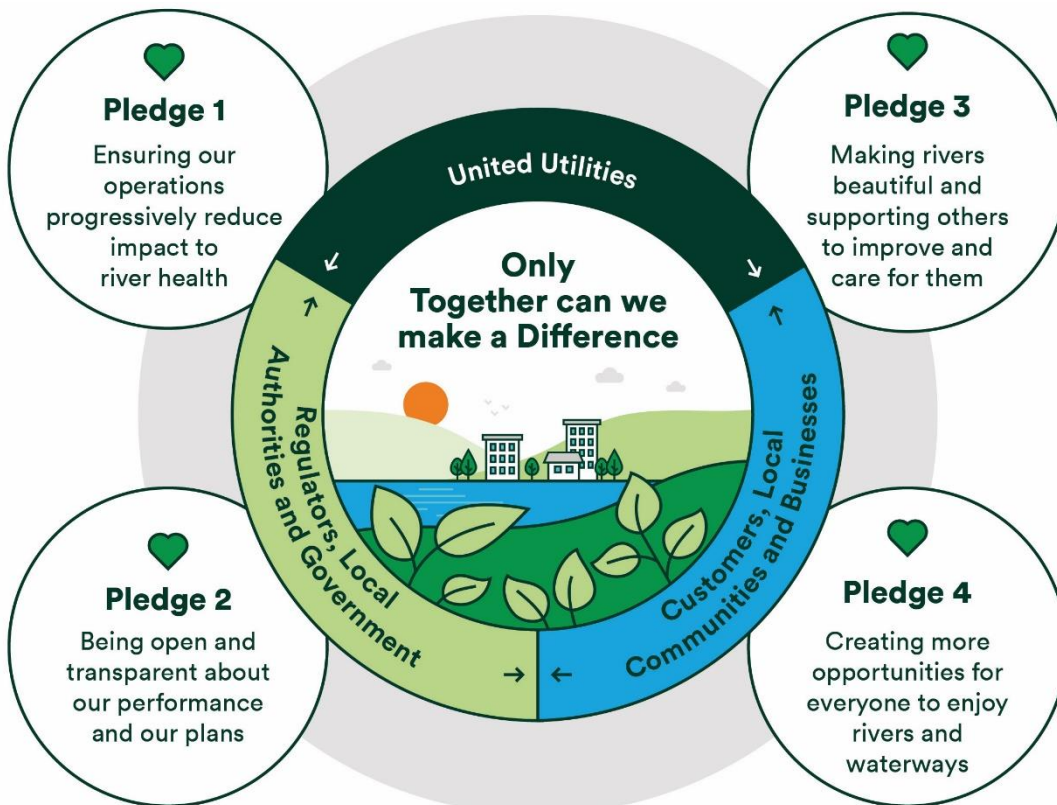
The North West is home to some of the most beautiful natural landscapes. We take our role in protecting them very seriously so they can be enjoyed by all. We are investing significantly to reduce the impact that wastewater has on the natural environment and our long-term ambition is to eliminate pollution incidents.

We want to demonstrate how we are addressing concerns regarding storm overflows and making our contribution to improving river health. Through our Better Rivers: Better North West plan, we have made four pledges which will include improving our wastewater network and treatment assets, collecting more data and sharing it, greater innovation and more use of nature-based solutions (Figure 20).

We are determined to build a coalition of the willing to improve the region’s river water quality and catalyse action from many parties. At the heart of this will be addressing surface water management at scale and securing continued investment in effective end-to-end wastewater management is necessary to improve river water quality. This programme sets out our ambitions for the next three years and beyond.

You can find out more about the Better Rivers: Better North West plan on our website (<https://www.unitedutilities.com/corporate/responsibility/environment/reducing-pollution/storm-overflows/our-commitments-to-river-health/>).

Figure 20 Overview of the Better Rivers: Better North West project



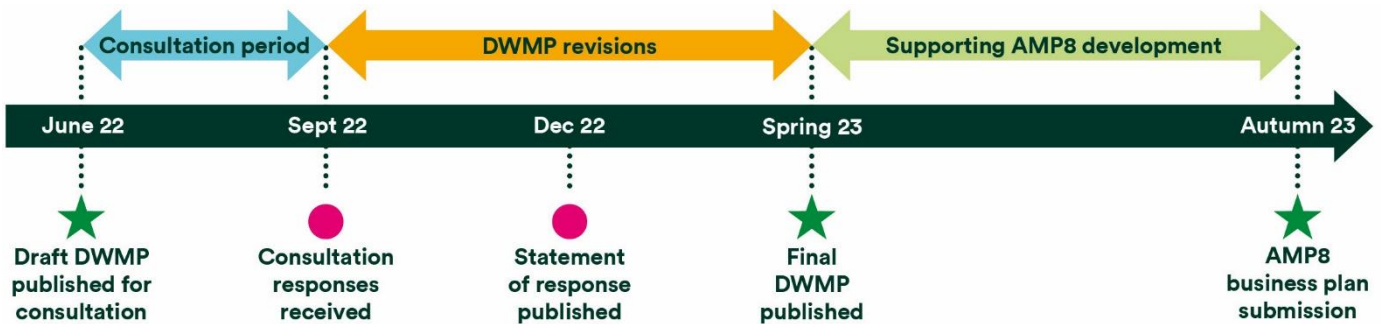
6. Embedding the DWMP

Since we began our DWMP journey when the framework was published in 2018, we have now produced our first ever plan. We have done this with the support from customers and stakeholders where we have listened to, reflected upon and made changes to different views, priorities and ambitions that we have for the North West, now and in the future.

The DWMP encompasses a host of documents covering different topic areas from assessing risks to identifying opportunities, and the SPA documents like this one for the Waver Wampool catchment. The DWMP is not a static programme and will continue to work with stakeholders to develop partnership options and strategies, which will make a difference within the Waver Wampool catchment.

Moving forwards, the DWMP will be a key component in the development of our business plan for investment cycle 2025 – 2030 (AMP8, Figure 21). Here, we will be able to continue to work in partnership to identify joint opportunities to mitigate risk, to improve the environment and create spaces for communities to enjoy.

Figure 21 Timeline of key milestones



7. References

- [1] <https://environment.data.gov.uk/catchment-planning/ManagementCatchment/3109>
- [2] <https://www.westcumbriariverstrust.org/areas/wampool-and-waver>
- [3] <https://wcrp.maps.arcgis.com/apps/MapSeries/index.html?appid=d4bc74ba52a2455695444559164d3eac>
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Water for the North West