

United Utilities Water

DRAFT Drainage and Wastewater Management Plan 2023

South West Lakes DWMP

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Acronyms

For a list of acronyms, refer to document C0003.

1. Introduction to the 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. This is the first time that we are developing the plan and we have taken a comprehensive approach as we recognise the importance of long-term planning.

The heart of the plan will be built around collaborative and innovative working whilst 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 South West Lakes SPA.

2. Background to the South West Lakes catchment

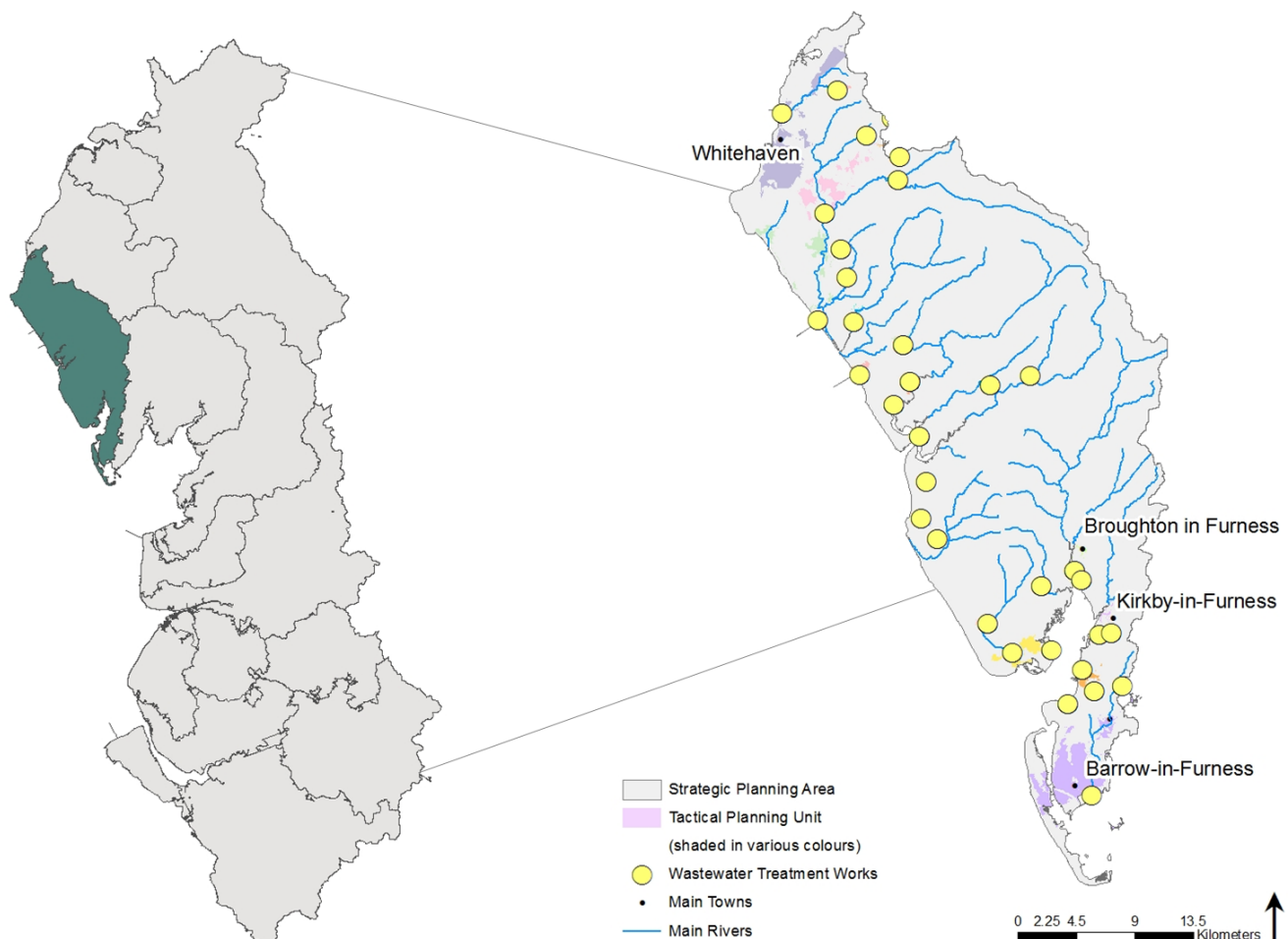
The South West Lakes catchment area is approximately 891.5km² and is located to the west of the Lake District National Park. This catchment includes Wastewater which is England’s deepest lake, and Ennerdale Water which is one of the most remote. The landscape is heavily dominated by a sheep and beef farming industry, with the presence of dairy farms and managed forestry included in the upper areas of the catchment ^[1].

There are three main sub catchments:

- Duddon – Located in the southern area of the catchment, Duddon is an area dominated by sheep and beef farming, there are parts of this sub catchment that are situated within the Lake District National Park with a small tourist industry ^[2].
- Ehen-Calder – Located at the north of the catchment, the River Ehen is a Special Area of Conservation due to its support of the largest population of freshwater mussels in England. It is an area that is dominated by sheep and beef farming ^[3].
- Irt, Mite, Esk and Annas – Located central in the catchment, this sub catchment also is dominated by sheep and beef farming, it is here in which Wastewater is found ^[4].

There are 32 wastewater tactical planning units (TPU, also known as wastewater treatment work (WwTW) drainage catchments) within the South West Lakes SPA. A TPU is the drainage catchment area encompassing all the sewers and wastewater assets e.g. pumping stations, which drain into the associated wastewater treatment works. The TPUs within the SPA vary in size from larger catchments such as Barrow to smaller, rural catchments such as Roanhead. The TPUs are highlighted in Figure 3.

Figure 3 Map of the South West Lakes SPA



There are numerous strategic management plans within the South West Lakes that are owned by various other organisations. Within the South West Lakes SPA, 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 South West Lakes catchment
River Basin Management Plan (RBMP) ^[5] Owner: Environment Agency	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.	The main reasons for not achieving good ecological status are physical modifications and pollution from rural areas, towns, cities and transport. Future challenges predicted by the Environment Agency include changes in natural flow and water levels, physical modifications, invasive non-native species and pollution from a range of sources.
Flood Risk Management Plan (FRMP) ^[6] Owner: Environment Agency	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.	Within the South West Lakes catchment, there are over 7,000 people (4%) and 1,600 non-residential properties that are at risk of fluvial and coastal flooding. There is also approximately 11% agricultural land, 25% SSSI and 59% Ramsar sites that are at risk of flooding. The Environment Agency continues to work closely with local councils to develop and promote flood risk management schemes and partnership funding. The December 2015 storms affected numerous towns and villages across the catchment. Since then, a programme of recovery was put into place. The Cumbria Floods Partnership Group was also formed which will consider mitigation measures such as improvements to existing flood defences and upstream management options such as slow the flow. Across the South West Lakes catchment there are 31 measures from earlier plans to manage flood risk.

<p>Shoreline Management Plan (SMP) ^[7]</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 between Havering and Seascope is to allow natural processes to continue along the majority of the frontage. Natural accretion of the dunes will provide protection to much of Havering; however, the continued provision of formal defences will also be required to address flood risk issues in this location.</p> <p>The short term plan at St. Bees is to continue to maintain the frontage for amenity/recreational/tourism value, but in the long term options will need to be investigated to allow the coast to realign to a more natural and affordable position to enable the beach to remain in the future.</p>
<p>Surface Water Management Plan (SWMP) ^[8]</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.</p> <p>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.</p> <p>United Utilities Water (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>	

Catchment Based Approach (CaBA)
Catchment Plan ^[5] ^[9] ^[10]

Owner: West Cumbria Catchment Partnership and the Beck to Bay South Cumbria Catchment Partnership

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.

The South West Lakes catchment is covered by two catchment partnerships: The West Cumbria Catchment Partnership and the Beck to Bay South Cumbria Catchment Partnership.

The aim of the West Cumbria Catchment Partnership is to:

- 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.

Current challenges identified in the catchment include physical modifications and pollution from rural areas and wastewater. Potential future challenges include invasive non-native species, pollution from wastewater and changes to the natural flow and water levels.

The vision of the Becks to Bay Catchment Partnership is to support a healthy, sustainable and diverse catchment system, which provides a wide range of benefits.

The catchment plan focusses on strategic aims such as:

- High water quality
- Resilience to flood and drought conditions
- Sustainable development
- Widespread biosecurity and invasive species control
- Diverse habitats that are rich in wildlife

Currently, 57% of waterbodies are failing to meet the required status. The main current and future challenges identified by the partnership include physical modifications, changes in natural flow and water levels, and pollution from agriculture and rural areas.

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 South West Lakes catchment we have engaged with stakeholders such as:

- The Environment Agency;
- Cumbria County Council;
- South Lakeland District Council;
- Barrow Borough Council;
- Copeland Borough Council; and
- West Cumbria Rivers Trust and the South Cumbria Rivers Trust (host of the West Cumbria and South Cumbria Catchment Based Approach (CaBA) partnerships).

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 South West Lakes catchment are outlined in Section 4.

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 South West Lakes SPA, the RBCS stage identified 22 out of 32 TPUs that required further investigation and therefore passed onto the BRAVA stage (outlined in Section 3.2).

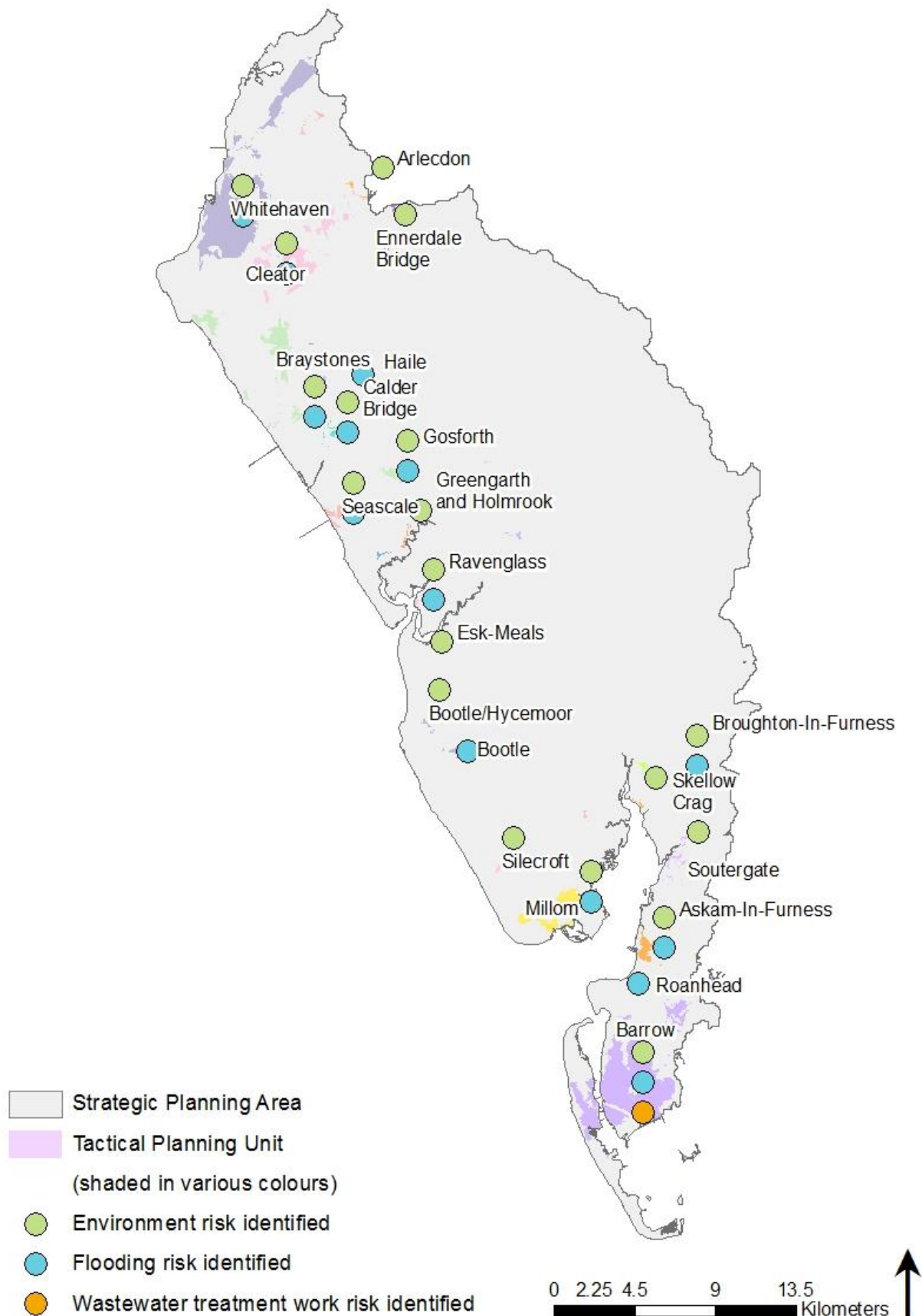
Figure 5 indicates which of the RBCS categories (environmental, flooding and wastewater treatment works capacity) have triggered within each TPU. There are numerous TPUs which did not trigger for RBCS across any of the categories and are therefore not shown in Figure 5. A list of these TPU's can be found in Table A.1 in the Appendix.

Environmental and flooding categories are the most common within the South West Lakes SPA (Figure 5), which is supported by the highest triggered RBCS assessments which are:

- Storm Overflow Assessment Framework - (19/32) – Environment; and
- External Sewer Flooding - (14/32) – 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 Risk Based Catchment Screening (RBCS) results for the South West Lakes SPA. Risk categories indicate areas triggering further investigation following Risk Based Catchment Screening. TPUs that were not triggered in RBCS can be found in table A.1 of the appendix



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 South West Lakes SPA are outlined in Table 2 to Table 5.

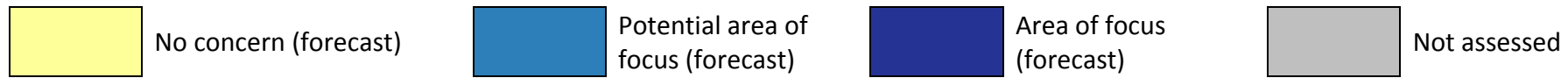
Table 2 Environmental BRAVA results

Tactical Planning Unit	Environmental					
	Pollution Assessment	Storm Overflow Performance		Bathing and Shellfish Spill Assessment		
	2020	2020	2050	2020	2030	2050
Arlecdon						
Askam-In-Furness						
Barrow						
Bootle						
Bootle/Hycemoor						
Braystones						
Broughton-In-Furness						
Calder Bridge						
Cleator						
Ennerdale Bridge						
Esk-Meals						
Gosforth						
Greengarth and Holmrook						
Haile						
Millom						
Ravenglass						
Roanhead						
Seascale						
Silecroft						
Skellow Crag						
Soutergate						
Whitehaven						

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
Arlecdon													
Askam-In-Furness													
Barrow													
Bootle													
Bootle/Hycemoor													
Braystones													
Broughton-In-Furness													
Calder Bridge													
Cleator													
Ennerdale Bridge													
Esk-Meals													
Gosforth													
Greengarth and Holmrook													
Haile													
Kirkland													
Millom													

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
Ravenglass													
Roanhead													
Seascale													
Silecroft													
Skellow Crag													
Soutergate													
Whitehaven													

Table 4 Wastewater treatment works BRAVA results

Tactical Planning Unit	Wastewater Treatment Works		
	Risk of wastewater treatment works (WwTW) Capacity		
	2020	2030	2050
Askam-In-Furness			
Barrow			
Braystones			
Broughton-In-Furness			
Calder Bridge			
Cleator			
Esk-Meals			
Gosforth			
Greengarth and Holmrook			
Haile			
Millom			
Ravenglass			
Roanhead			
Seascale			
Silecroft			
Soutergate			
Whitehaven			

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

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
Arlecdon			
Barrow			
Bootle			
Braystones			
Calder Bridge			
Cleator			
Ennerdale Bridge			
Eskdale Green			
Gosforth			
Greengarth and Holmrook			
Haile			
Kirkland			
Millom			
Pica			
The Green			
Waingate Bridge			
Whitehaven			

Resilience	
	More resilient
	Less resilient
	Not assessed

3.3 Problem characterisation

3.3.1 Complex catchments

Complex catchments were determined using 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 South West Lakes SPA, 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.

As a result of this assessment the following TPUs in the South West Lakes SPA have been identified as having 'strategic growth':

- Whitehaven.

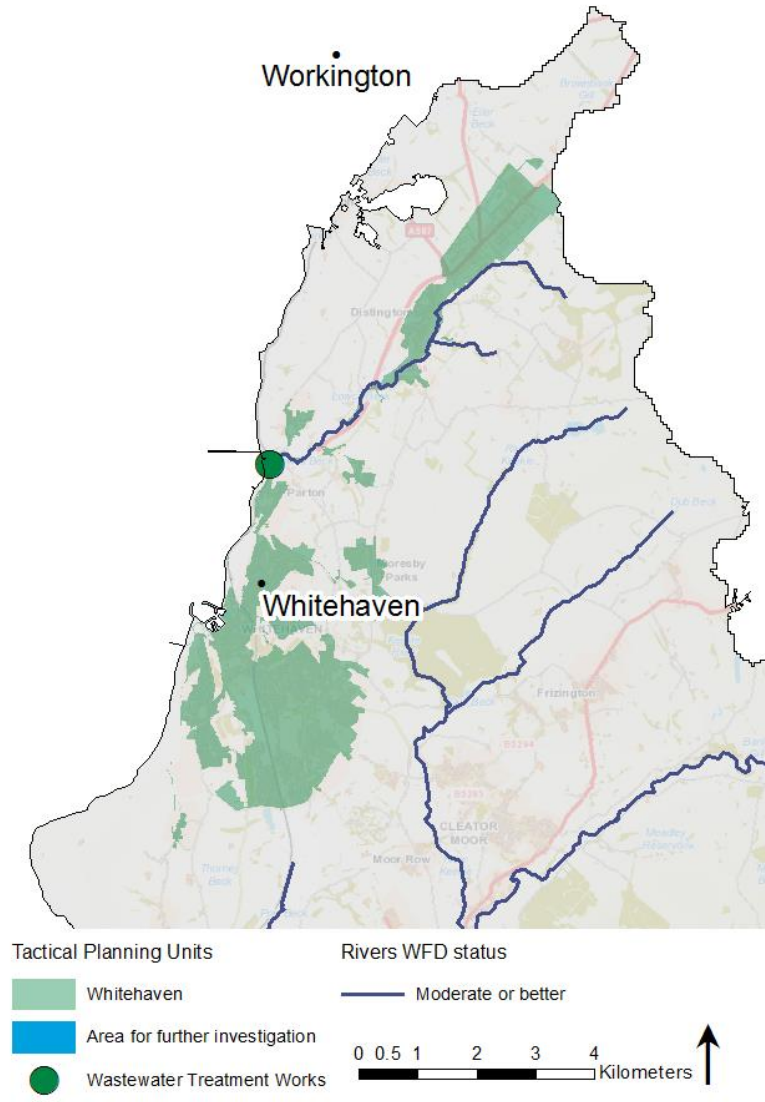
Note: Water Industry National Environment Programme (WINEP) and storm overflows guidance are still being developed. This could lead to significant changes in preferred options and could result in large-scale, short and long-term investment needs. This will be fully reviewed between draft and final DWMP publication, in addition to other aspects such as nutrient neutrality, bathing waters and shellfish water expectations. Between draft and final DWMPs the impact of storm overflow requirements will also require optimising against the other needs and opportunities.

3.3.3 Whitehaven

The Whitehaven TPU is to the north west of the South West Lakes SPA (Figure 6). The area consists of approximately 380km of sewer network, which serves a residential population of just under 30,000 people and over 14,000 properties. The residential population is projected to increase 12% by 2050. The main watercourse is the Lowca Beck, which is classed as 'moderate' under the Water Framework Directive (WFD) 2019.

Whitehaven is a complex catchment, with a number of storm overflows within the area, and uncertainty around medium and long term performance particularly with regards to meeting future new targets. The BRAVA process also identified risks for internal flooding, external flooding, flooding of open spaces, flooding in 1-in-50-year storm events, pollution, sewer collapse and blockages by 2050.

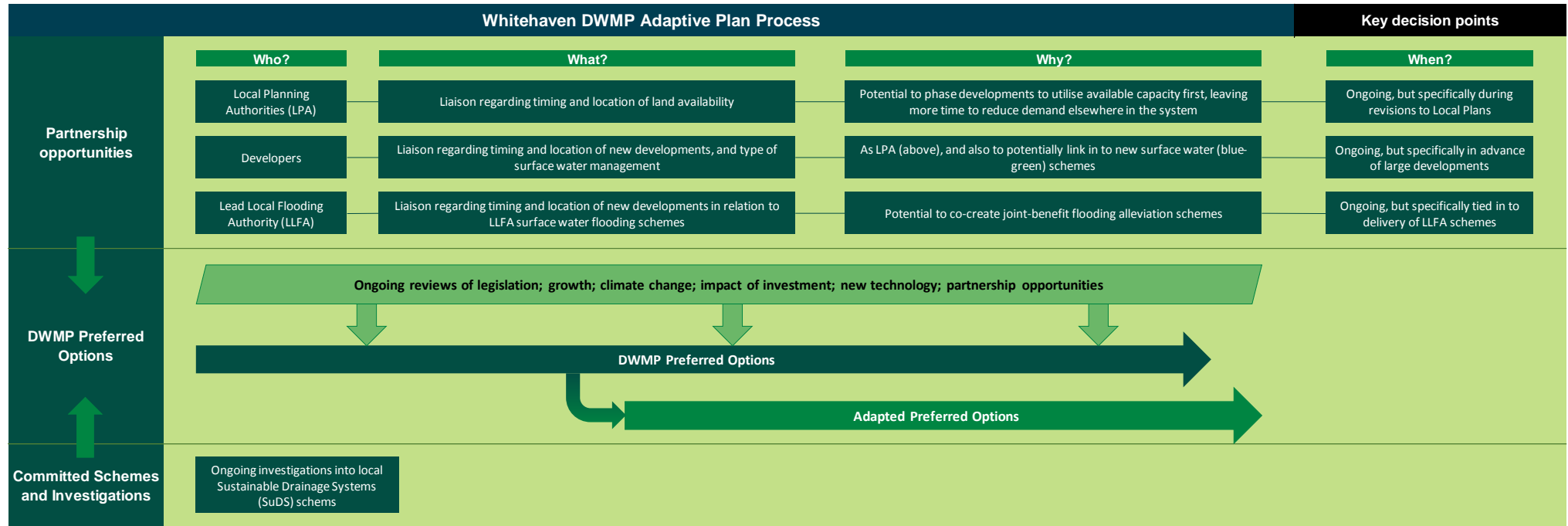
Figure 6 Map of the Whitehaven TPU



3.3.3.1 Whitehaven adaptive plan

The first part of the adaptive plan process (Figure 7) highlights the importance of partnership working and regular data reviews.

Figure 7 Whitehaven adaptive planning process



Partnership working

In a catchment where growth is a significant factor in future performance, it is key to maintain regular conversations with those stakeholders that have knowledge about future developments and can potentially influence their impact. Key organisations include:

- Local Planning Authority;
- The Environment Agency;
- Lead Local Flood Authorities; and
- Housing developers.

The DWMP plan for each TPU is developed based on a number of data sources. Some of these are prone to change over time, which means that original assessments can become out of date. As data from these sources change, it makes sense to re-evaluate the DWMP plan to check the impact on the plan. Examples of data that change over time are shown in Table 6.

Table 6 Examples of data that change over time and can impact upon the plan

Type of data or information	Possible impacts of changes
Government legislation	More or less stringent requirements or regulations, which may require different levels of investment, and policy changes that may drive better or worse incentives on demand.
Development growth projections	These will vary with time in line with economic conditions, changing demographics, or government policy. This can result in the number of new houses and businesses growing at a different rate than originally forecast.
Climate change projections	As more climate data becomes available, climate projections are modified, which may indicate changes to temperature and rainfall patterns.
Impact of investment	As new drainage schemes or new strategies are implemented, we will continue to evaluate their performance. If they turn out to be more or less successful than anticipated, this may allow the extent of another option type to be reduced or increased accordingly.
Development of new technology	Over time, new technology provides opportunities to address and resolve risks differently, or more efficiently.
Partnership opportunities	We will work closely with key stakeholders to address risks jointly. Over time, these stakeholders may see changes in their own risks and funding levels, which may present opportunities for greater collaboration.

Figure 8 shows the second part of the Whitehaven adaptive plan, reflecting the different option types identified as being appropriate for Whitehaven. Each line represents a different option type – e.g. schools education programme. The plan shows that each option type will be regularly reviewed in line with the method described in part one. This allows new information and opportunities to be used to adapt the plan by either increasing or reducing the extent of some option types.

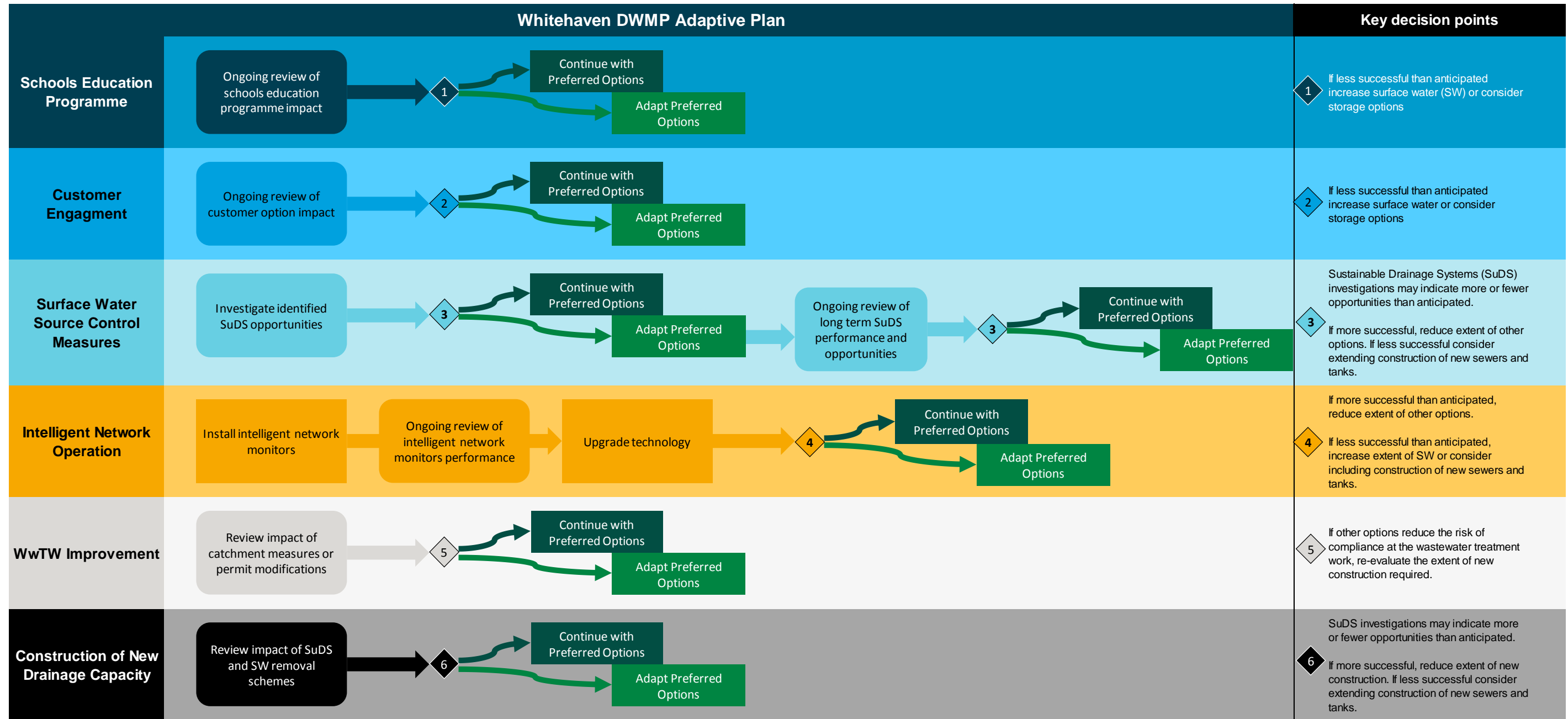
Within Whitehaven, there are opportunities to carry out investigations before making final decisions on the final strategy. This means that we can properly evaluate options before committing to significant investment. These investigations will take into account things such as:

- Technical feasibility;
- Benefit of the work;
- Customer impact;
- Environmental impact; and
- Cost.

The adaptive plan below demonstrates multiple potential scenarios and pathways, and should be read in conjunction with the optimised DWMP plan for the relevant TPU (refer to Section 5.3).

The adaptive plan should be reviewed regularly in order to incorporate potential changes in key factors such as legislation, population growth and climate change, which could impact standards or targets, as highlighted in Figure 7. The adaptive plan may contain potential investigations which are currently excluded from the optimised DWMP plan (refer to Section 5.3) until there is more certainty. It is therefore important that both the adaptive plan and the optimised plan are developed together.

Figure 8 Whitehaven adaptive plan – Possible adaptive pathways as knowledge and opportunities change over time



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 9).

An options hierarchy was then used which has been endorsed by customers and stakeholders from across the North West to select preferred solutions (Figure 10). 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 9 Options development process

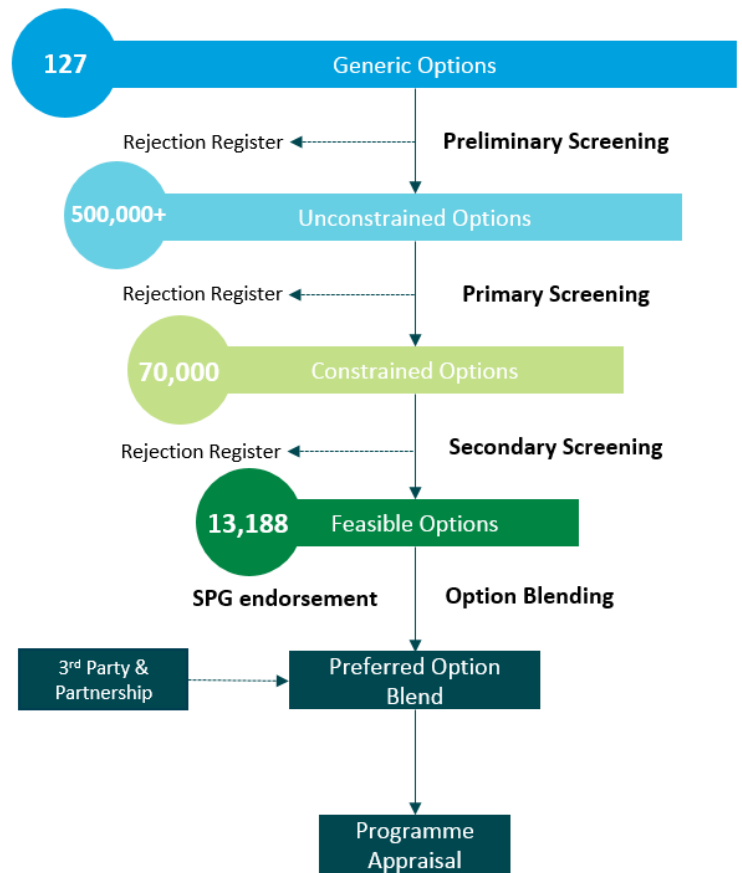
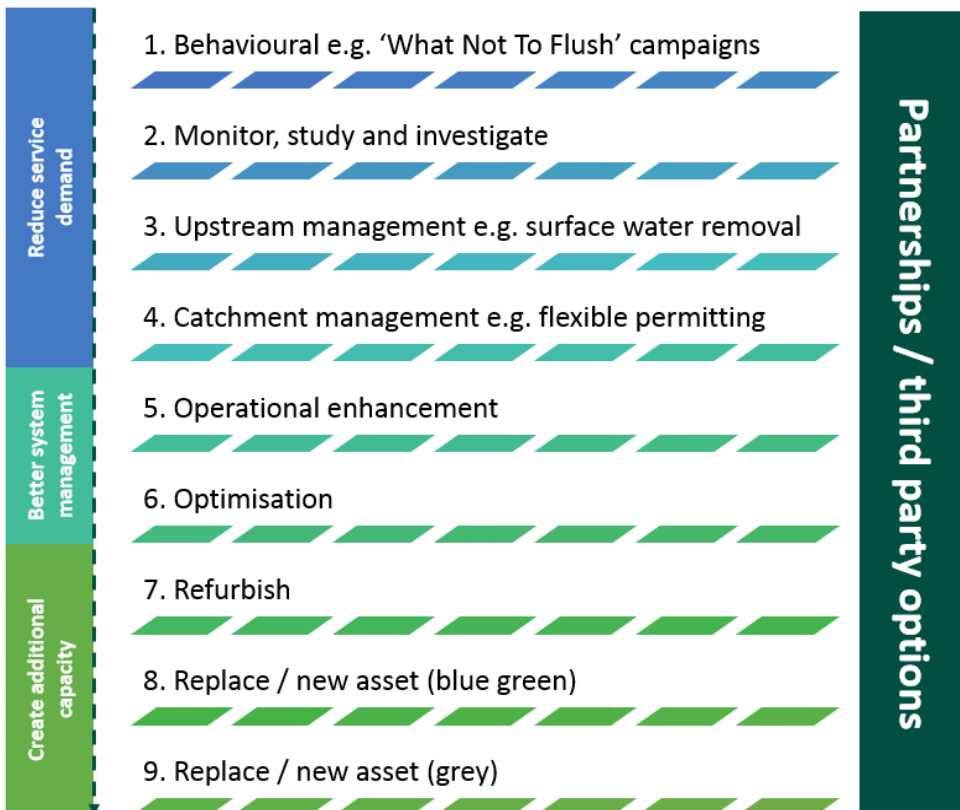


Figure 10 Options hierarchy



4.1 South West Lakes partnership options

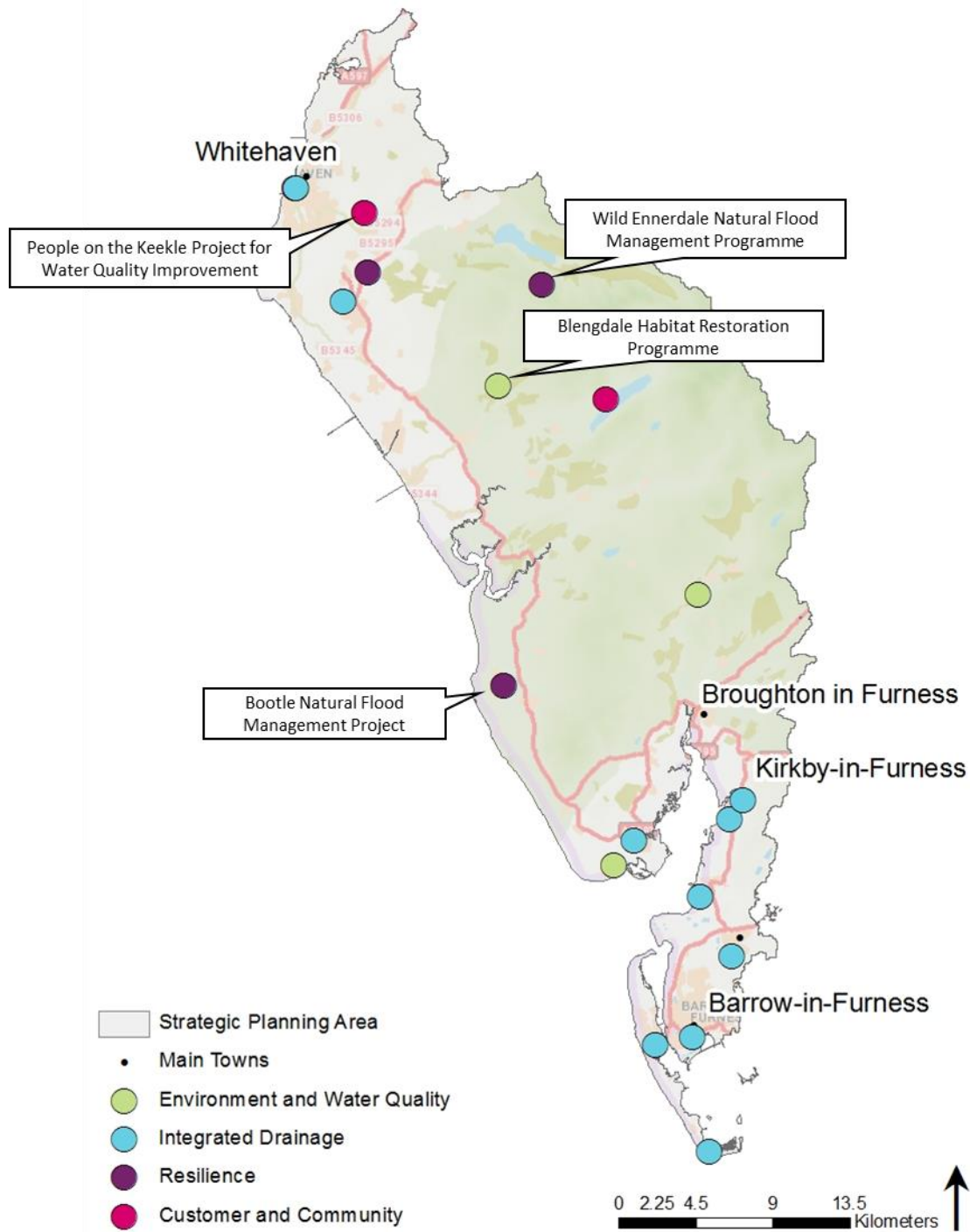
In order to identify and develop potential partnership options in the South West Lakes SPA, through the SPG we have shared the results from the risk identification stages such as BRAVA. This was done through a series of workshops and the purpose was to identify areas of shared risk and partnership opportunities which have been reviewed against the wider DWMP options development process (refer to Section 5.2).

The options shared were reviewed by the DWMP team and a second SPG workshop was held to gather additional information regarding potential partnership opportunities. This allowed us to understand timescales, likelihood of investment and potential organisations involved. An opportunities pipeline 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 necessarily funded schemes. However, they provide an indication of areas where we may be able to work collaboratively with partners in the future when more certainty is ascertained about need and funding. Examples of potential partnership locations are shown in Figure 11.

We have actively engaged with our SPGs to ensure that this is a collaborative process. Moving forwards, we are currently developing our Partnership Framework for the investment cycle 2025 – 2030 and beyond. The DWMP partnership opportunities pipeline will feed into this, forming an initial view of partners and opportunities. When developing the business plan, further engagement will be undertaken to where an opportunity is aligned to a 2025 – 2030 investment need. In addition to scheme specific collaboration opportunities, 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 11 Overview of the potential partnership opportunities in the South West Lakes SPA



5. Options for the South West Lakes

5.1 Options considered

Following a number of iterative screening processes outlined in Section 4, a list of feasible options was developed for each TPU within the South West Lakes catchment. Options can be categorised into a number of categories:

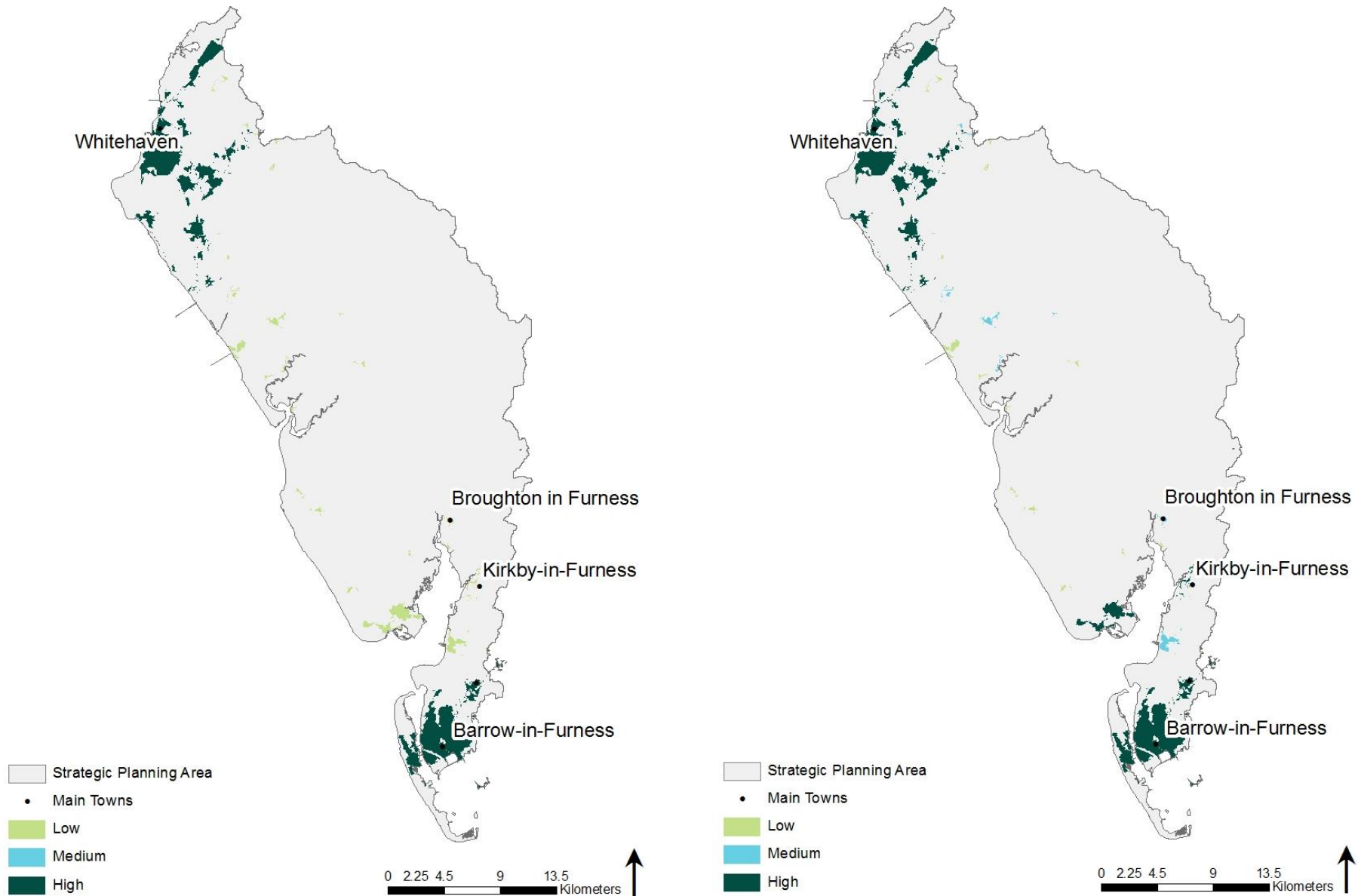
- Customer engagement;
- Monitor and investigate;
- Upstream management;
- Catchment management;
- Operational enhancement;
- Optimisation;
- Refurb/New asset (blue/green); and
- Refurb/New asset (grey).

Of these options 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 South West Lakes SPA 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 Whitehaven and Barrow TPUs.

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 Whitehaven, Barrow and Cleator TPUs (Figure 12).

Figure 12 Maps show the benefit of implementing regional customer engagement (left) and sustainable drainage solutions (right) options across the South West Lakes SPA



5.2 Preferred options

Note: Water Industry National Environment Programme (WINEP) and storm overflows guidance are still being developed. This could lead to significant changes in preferred options and could result in large-scale, short and long term investment needs. This will be fully reviewed between draft and final DWMP publication, in addition to other aspects such as nutrient neutrality, bathing waters and shellfish water expectations. Between draft and final DWMPs the impact of storm overflow requirements will also require optimising against the other needs and opportunities detailed in this section to assess synergy/conflict and best value.

The data below do not include planned investment in addressing storm overflows. The future standards for overflows are currently the subject of the Government’s Storm Overflow Discharge Reduction Plan Consultation, and the outcome is not yet determined, so it has not been possible to include these in the screening process described below.














A high-level regional assessment has been carried out to estimate the likely investment requirements to address all overflow risks, but due to the uncertainty described above, this has not been broken down by Strategic Planning Areas. This information can be found in the DWMP main document.

Utilising data collected at the various stages of developing the DWMP (BRAVA, partnership opportunities and the data in Figure 12, preferred options were selected using a decision support tool and following the hierarchy principles. We have also included in this plan high confidence schemes that we believe are likely to have secured investment.

In addition the partnership opportunities highlighted in Section 4.1 are considered key for delivery of the options set out below. These will be investigated in detail in preparation for the investment plan for the period 2025-2030.

The following colour schemes are used for all charts and graphs in this section to represent each option type (Figure 13).

Figure 13 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

The first four option types are all grouped under the strategic heading of 'Reduce Service Demand', and are options that focus on either reducing the amount of wastewater that is produced, or preventing it from reaching the sewer network.

The second strategic group is 'Better System Management' and looks to try and manage and operate the existing assets in a more efficient or effective manner.

The final group is 'Create Additional Capacity'. This is about 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.

Across the South West Lakes SPA, the outcomes seen as a result of investment and benefit in each option type are shown in Figures 14, 15 and 16.

Figures 14 and 15 show how potential investment could be split between the three high-level option strategies – reduce demand, system management and new capacity – and then further sub-divides these into the individual option types.

Figure 14 shows potential options to address environmental planning objectives, which incorporate:

- Wastewater treatment work permit compliance;
- WINEP compliance; and
- Pollution of watercourses.

Figure 15 shows potential options to address flooding planning objectives, which incorporate:

- Internal flooding;
- External flooding;
- Highway and open space flooding; and
- 1 in 50-year flooding.

Note that the percentages shown in Figures 14 and 15 are the proportions of investment within each planning objective type (flooding and environmental), but the total values of flooding and environmental investment are not equal. This split can be seen in more detail for each TPU in Section 5.3.

Figure 16 shows how these options could contribute to addressing the planning objectives – environmental and flooding.

Figure 14 South West Lakes Strategic Planning Area: Distribution of environmental investment by option type

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 improvements in wastewater treatment works. This chart does not show planned investment in improving overflow performance as these are not based on cost beneficial assessments.

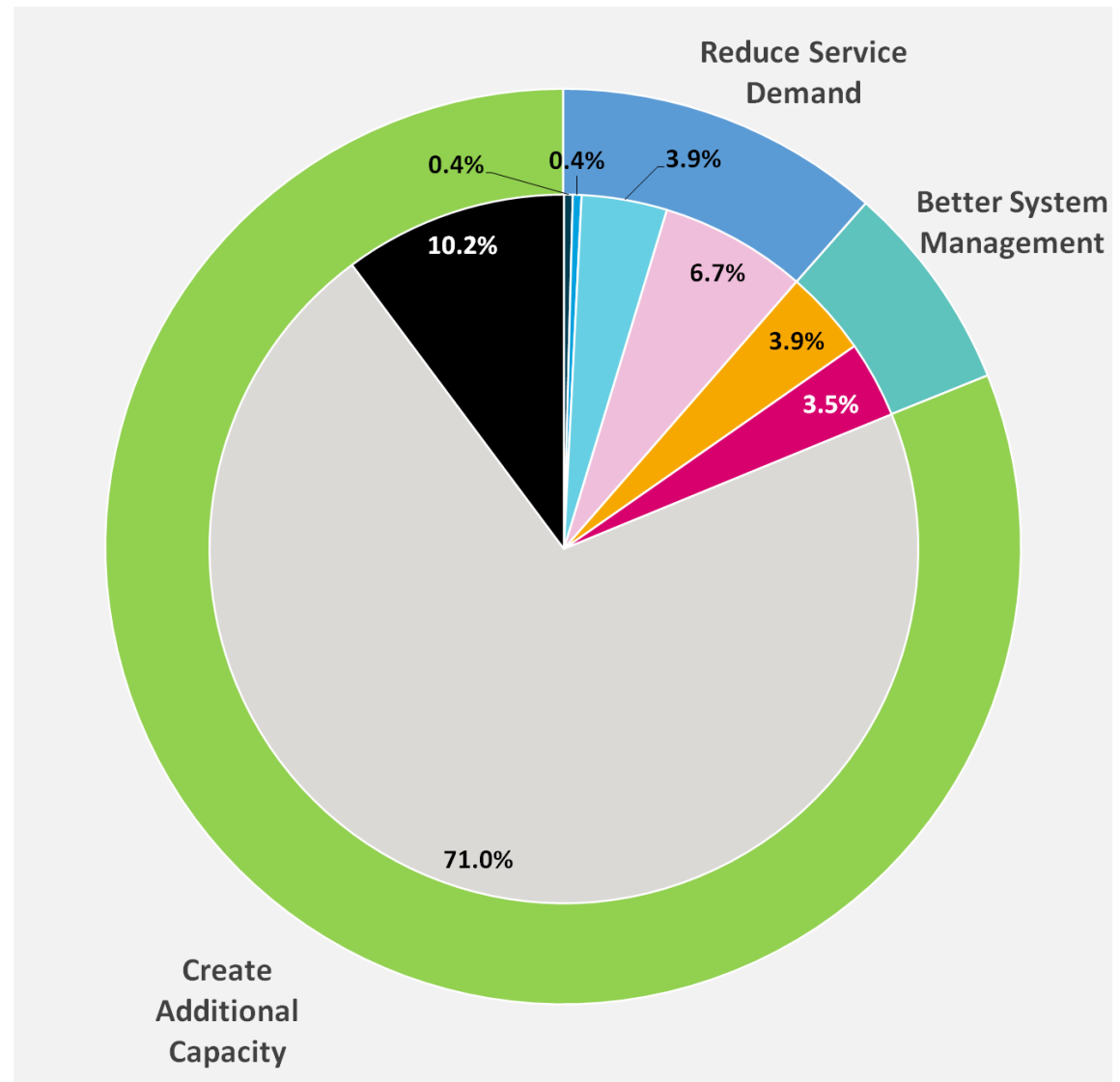
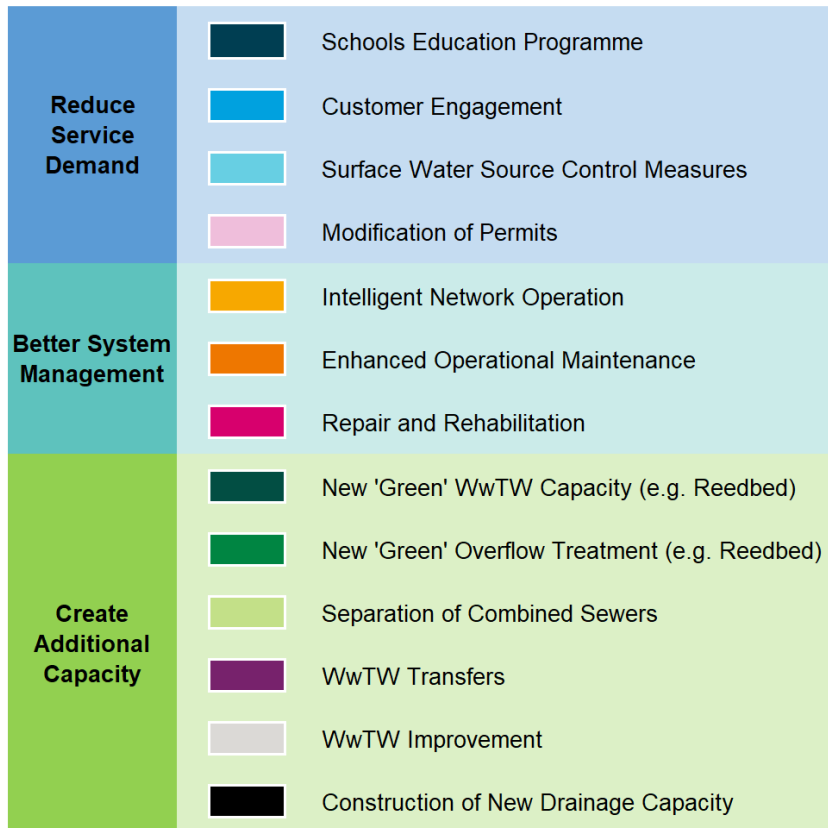


Figure 15 South West Lakes Strategic Planning Area: Distribution of flooding investment by option type

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

Around 20% of the investment could be in construction of new stormwater storage tanks, with around 10% in improving existing system management, with options such as intelligent network operation and repair and rehabilitation.

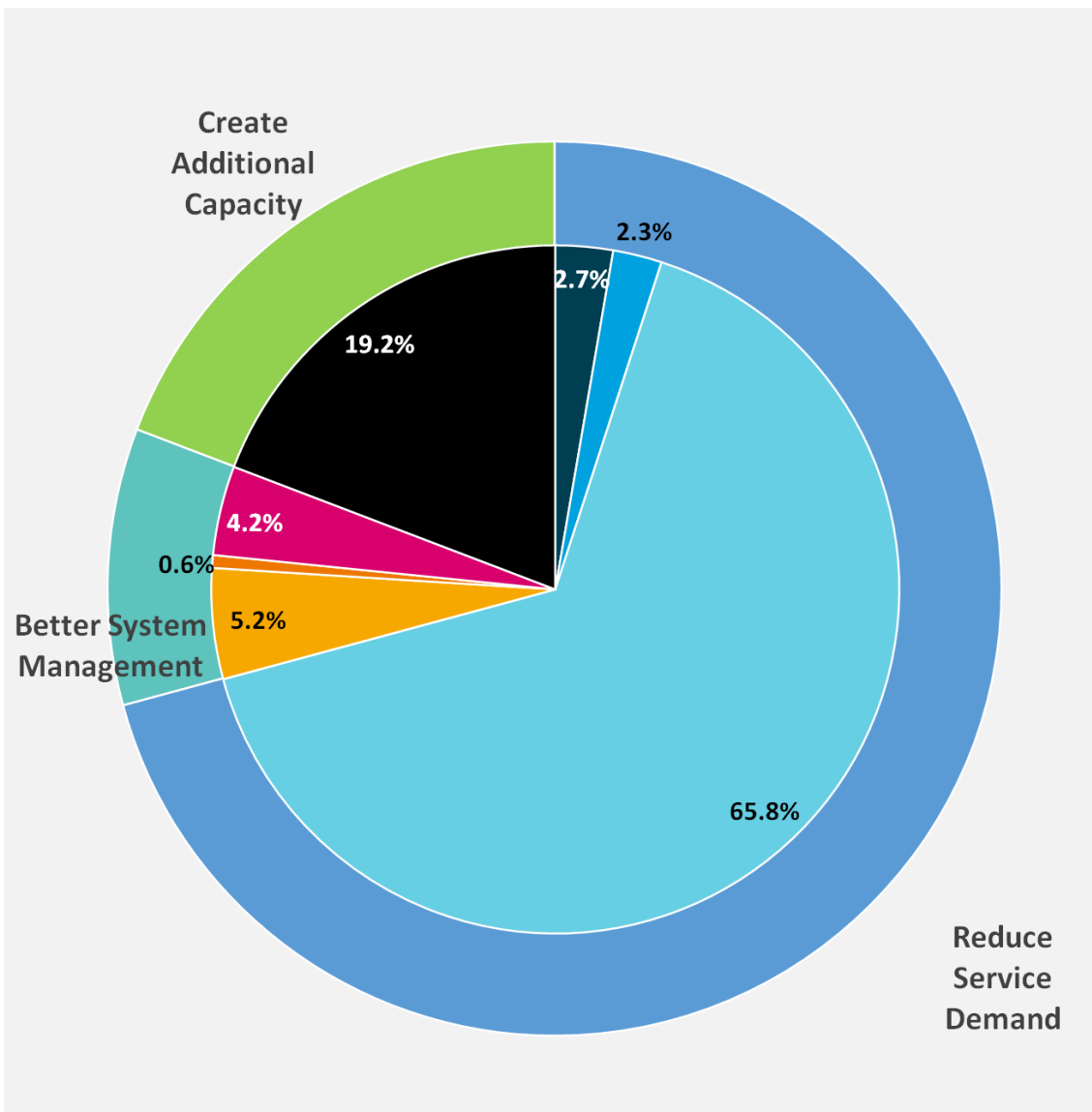
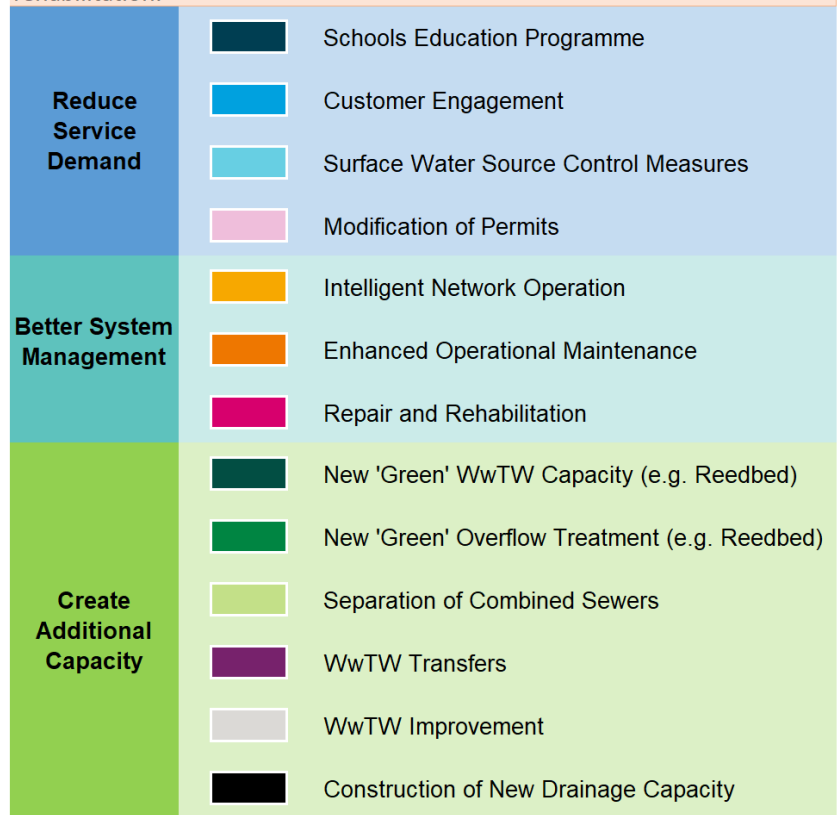
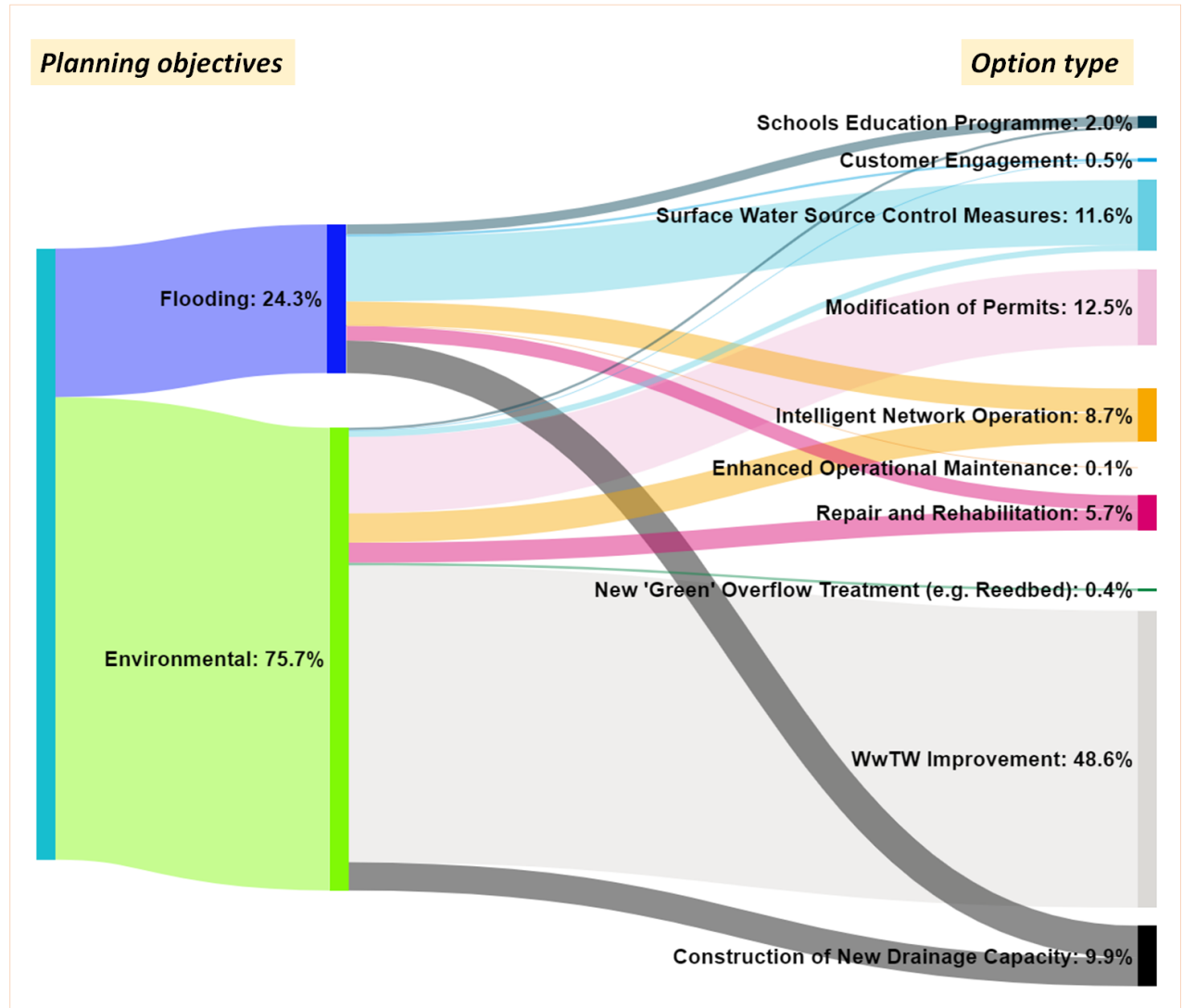
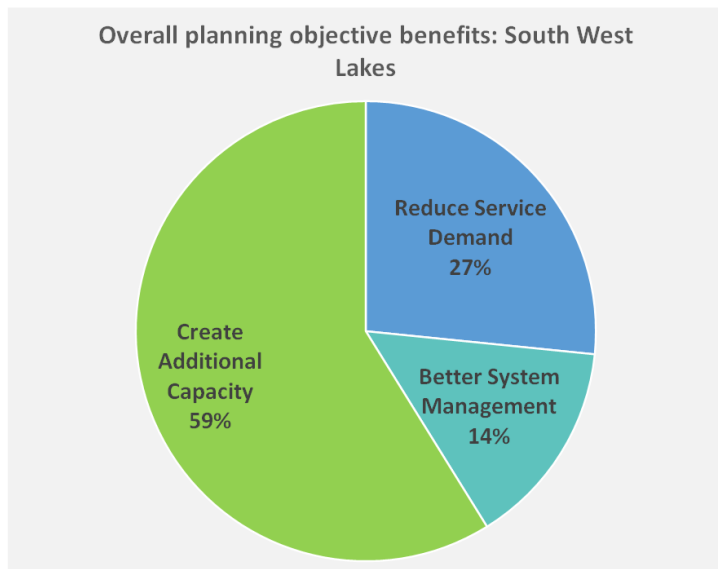


Figure 16 Distribution of benefit by option type within South West Lakes SPA

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

United Utilities Water (Uuw) commitments to improving flooding performance could be met through the reduction of surface water flows, construction of new stormwater drainage capacity, installation of intelligent network operation systems, and schools and customer engagement programmes.

Environmental planning objectives could be met mainly through the provision of wastewater treatment works improvements, new green overflow treatment and stormwater storage capacity, including the modification of permits, supported by improved operational maintenance.

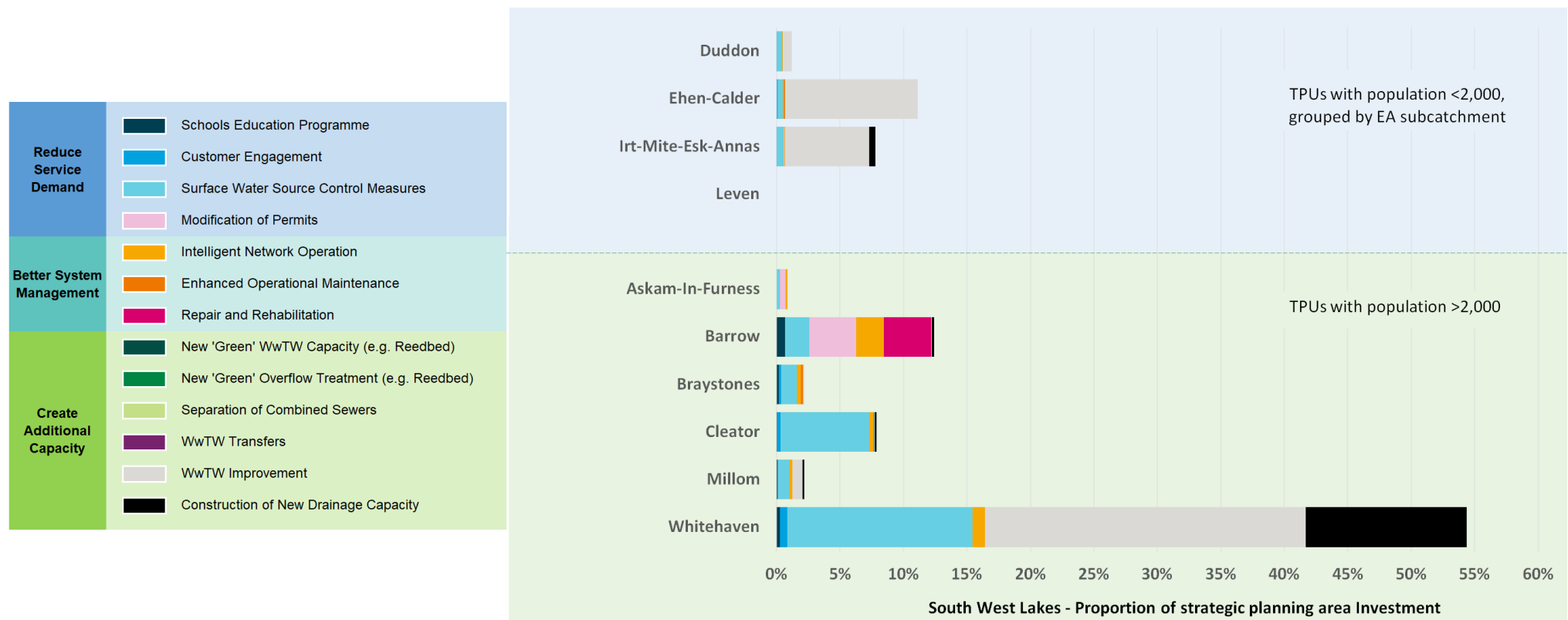


5.3 Overview of preferred options in each TPU

Figure 17 shows the proportion of South West Lakes SPA potential investment in each TPU, split up by option type. 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 SPA sub catchment (Environment Agency Operational Catchment boundaries).

It can be seen that in the South West Lakes SPA, the largest TPUs see the largest potential investment, which is split predominantly between improvements at wastewater treatment works, surface water control, improved system management, and construction of new storm water storage tanks.

Figure 17 Proportion of investment seen in each TPU within the South West Lakes SPA



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.

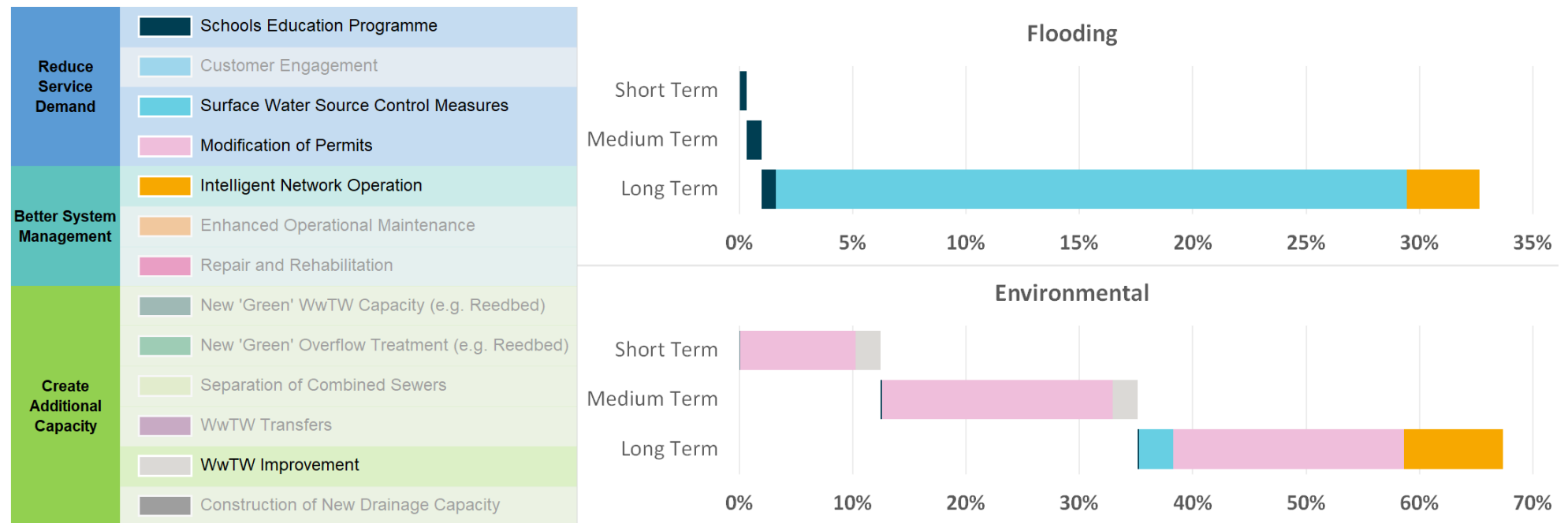
5.3.1 Askam-In-Furness

The results from the DWMP show that if we were to invest in Askam-In-Furness over the next 25 years, around 33% of the investment could be to address flooding risks, and around 67% of investment could be to address environmental risks (Figure 18).

In the short and medium terms, potential investment could be through the provision of improvements to wastewater treatment works, the modification of permits and school education programmes.

In the longer term, investments could be mainly through new surface water source control measures, and the installation of intelligent network monitoring systems, as well as continuing with all previous options.

Figure 18 Short, medium and long-term investment in the Askam-In-Furness TPU, distributed by option type



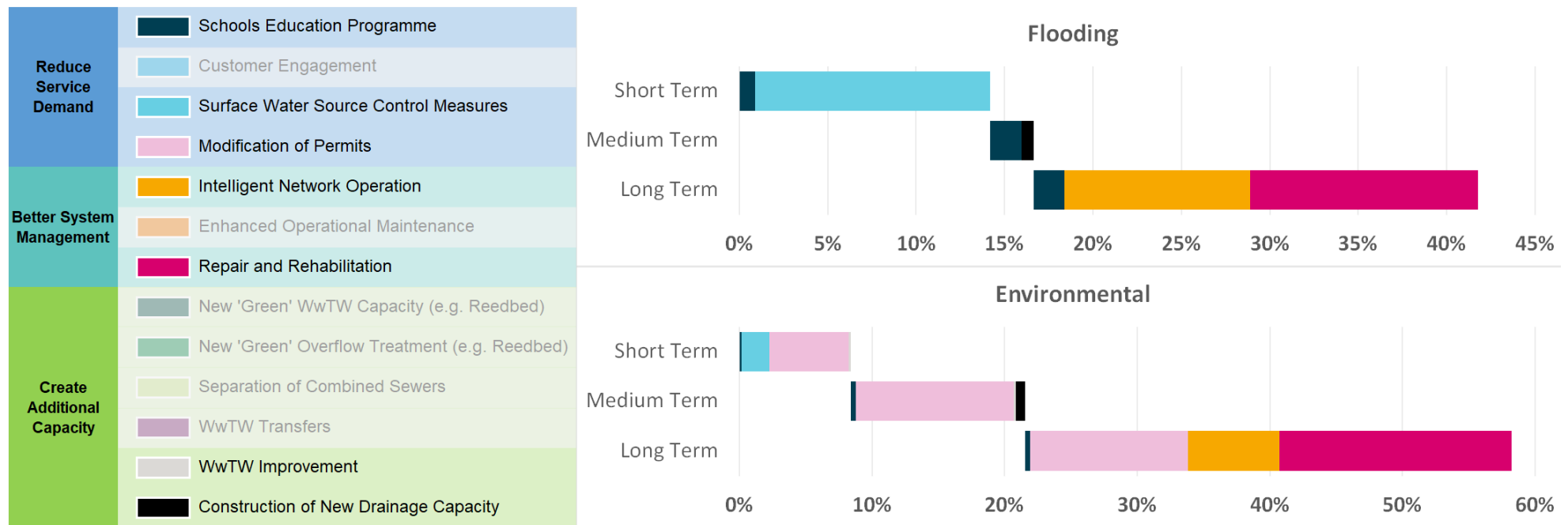
5.3.2 Barrow

The results from the DWMP show that if we were to invest in Barrow over the next 25 years, around 42% of the investment could be to address flooding risks, and around 58% of investment could be to address environmental risks (Figure 19).

In the short and medium terms, potential investment could be through new surface water source control measures, the modification of permits and schools education programmes.

In the longer term, existing intelligent network monitoring systems that are already in place could be replaced or updated. School education programmes could continue and be supplemented by customer engagement programmes. There could also be investment in the repair and the rehabilitation of the existing network.

Figure 19 Short, medium and long-term investment in the Barrow TPU, distributed by option type



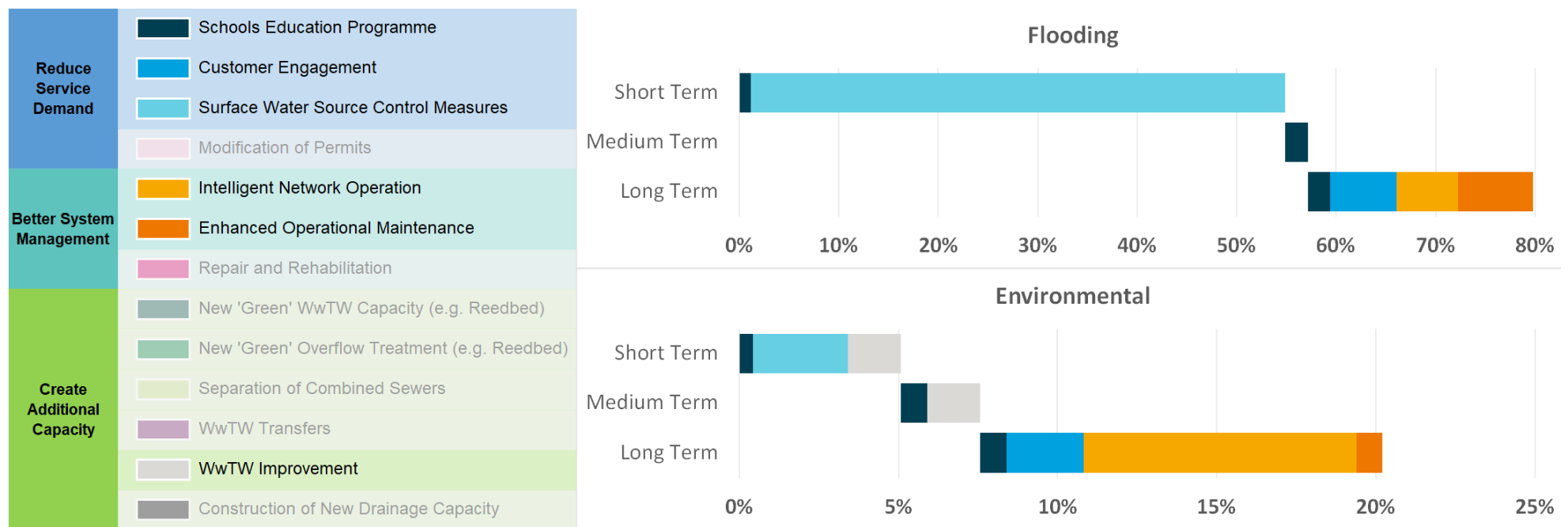
5.3.3 Braystones

The results from the DWMP show that if we were to invest in Braystones over the next 25 years, around 80% of the investment could be to address flooding risks, and around 20% of investment could be to address environmental risks (Figure 20).

In the short and medium terms, potential investment could be through new surface water source control measures, improvements in wastewater treatments works and school education programmes.

In the longer term, intelligent network monitoring systems could be introduced. School education programmes could continue and be supplemented by customer engagement programmes. There could also be investment in enhanced operational maintenance of the existing network.

Figure 20 Short, medium and long-term investment in the Braystones TPU, distributed by option type



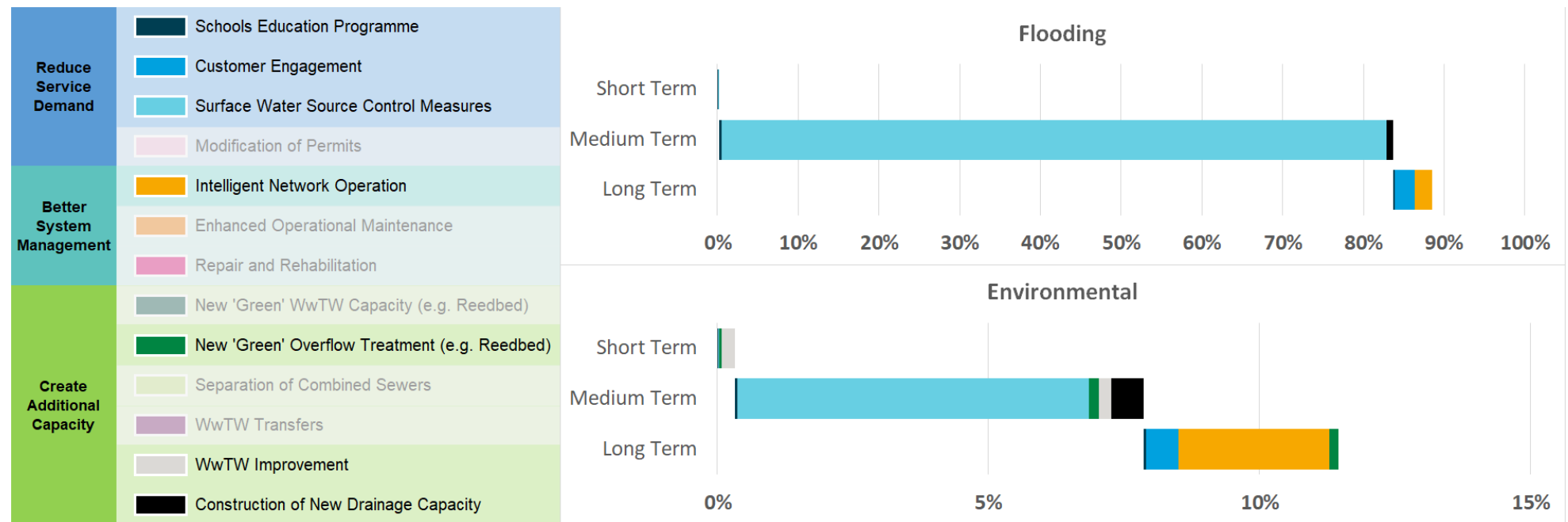
5.3.4 Cleator

The results from the DWMP show that if we were to invest in Cleator over the next 25 years, around 89% of the investment could be to address flooding risks, and around 11% of investment could be to address environmental risks (Figure 21).

In the short and medium terms, potential investment could be through new surface water source control measures, improvements in wastewater treatments works and school education programmes.

In the longer term, intelligent network monitoring systems could be introduced. Schools education programmes could continue and be supplemented by customer engagement programmes.

Figure 21 Short, medium and long-term investment in the Cleator TPU, distributed by option type



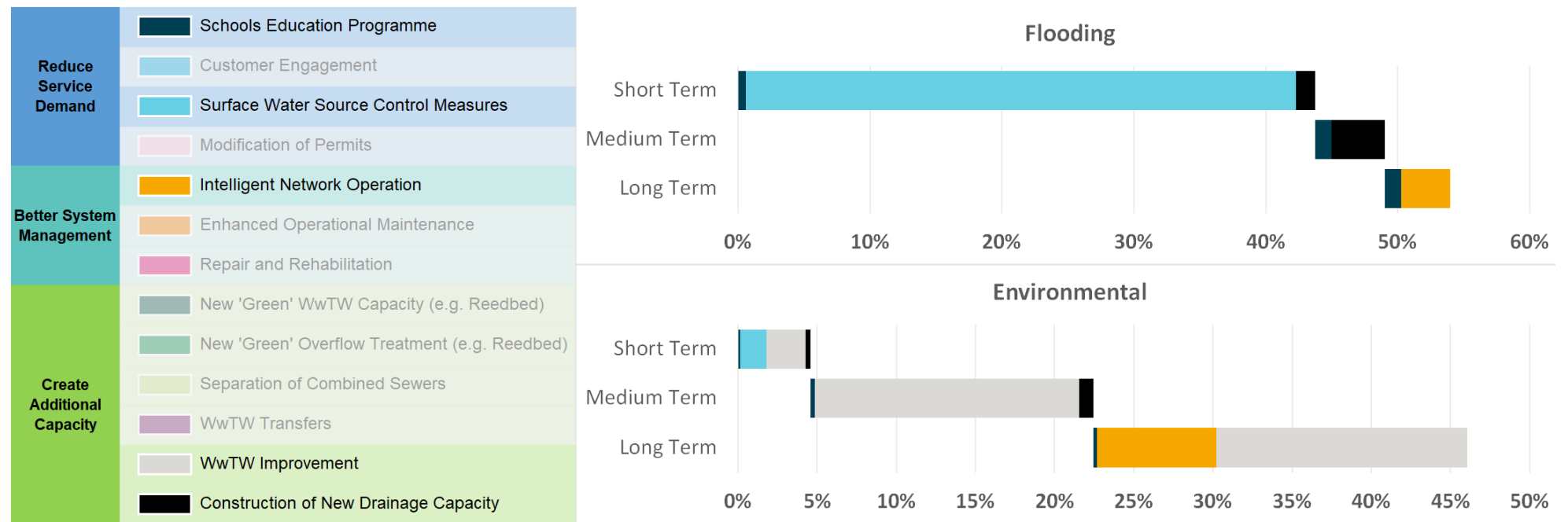
5.3.5 Millom

The results from the DWMP show that if we were to invest in Millom over the next 25 years, around 54% of the investment could be to address flooding risks, and around 46% of investment could be to address environmental risks (Figure 22).

In the short and medium terms, potential investment could be through new surface water source control measures, improvements in wastewater treatments works, construction of new drainage capacity and schools education programmes.

In the longer term, intelligent network monitoring systems could be introduced, as well as continuing with all previous options.

Figure 22 Short, medium and long-term investment in the Millom TPU, distributed by option type



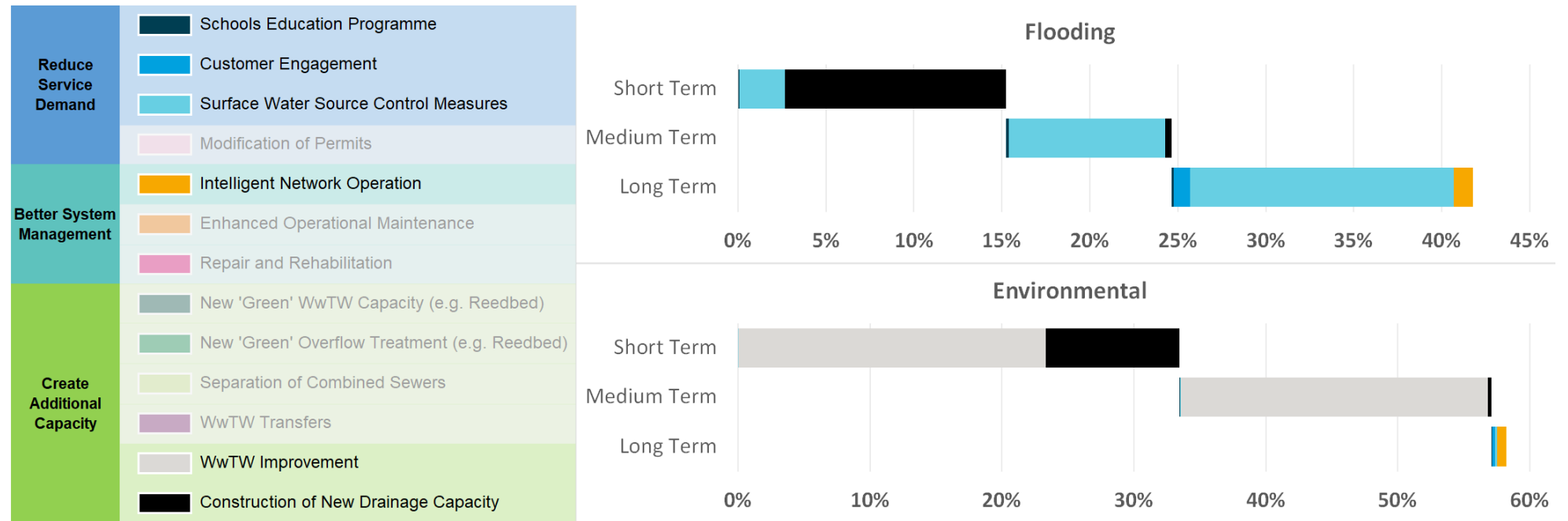
5.3.6 Whitehaven

The results from the DWMP show that if we were to invest in Whitehaven over the next 25 years, around 42% of the investment could be to address flooding risks, and around 58% of investment could be to address environmental risks (Figure 23).

In the short and medium terms, potential investment could be through new surface water source control measures, improvements in wastewater treatments works, construction of new drainage capacity and school education programmes.

In the longer term, intelligent network monitoring systems could be introduced, as well as continuing with all previous options.

Figure 23 Short, medium and long-term investment in the Whitehaven TPU, distributed by option type



5.3.7 TPUs with population less than 2,000: *Duddon* sub catchment

The following TPUs each have a population of less than 2,000, and have therefore been grouped together:

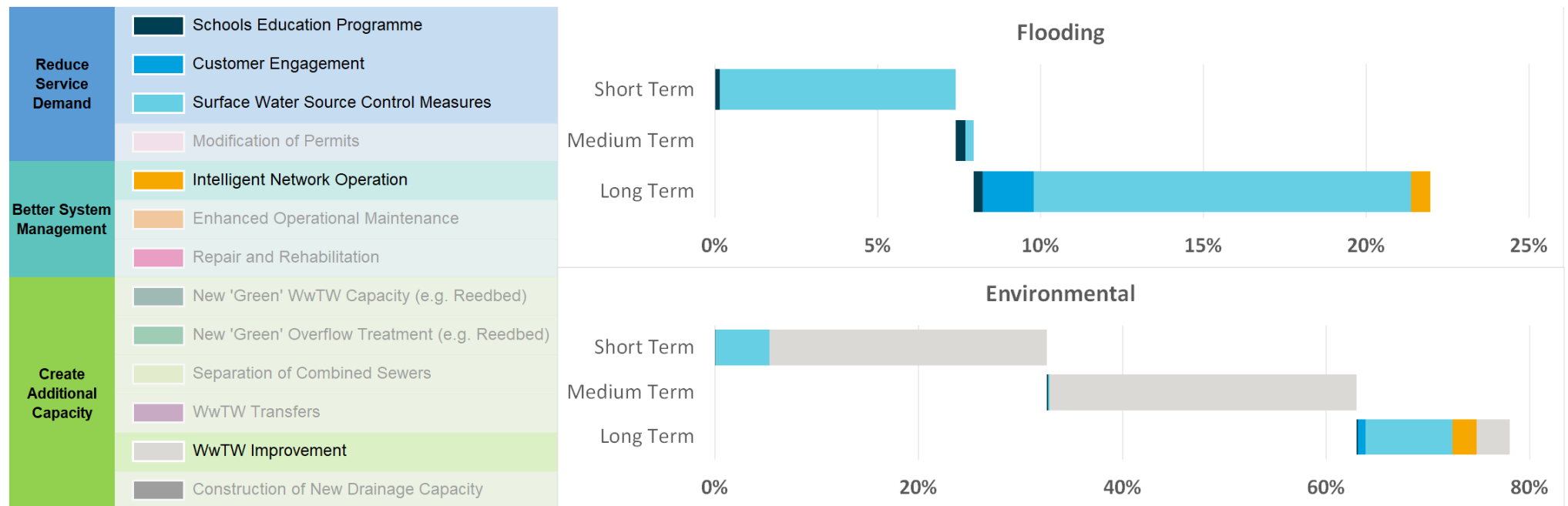
- Bank House Kirkby
- Broughton-In-Furness
- Greenscoe
- Roanhead
- Silecroft
- Skellow Crag
- Soutergate
- The Green
- Waingate Bridge

Around 78% of the potential investment in these small TPU could be to address environmental risks, and 22% could be to address flooding risks (Figure 24).

All short and medium term investments in these small TPUs could be through wastewater treatment improvement, surface water source control measures, and school education programme.

In the longer term, we could additionally invest in the installation of intelligent network operation systems and customer engagement programmes.

Figure 24 Short, medium and long-term investment in TPUs with population less than 2,000 (*Duddon* sub catchment) distributed by option type



5.3.8 TPUs with population less than 2,000: Ehen-Calder sub catchment

The following TPUs each have a population of less than 2,000, and have therefore been grouped together:

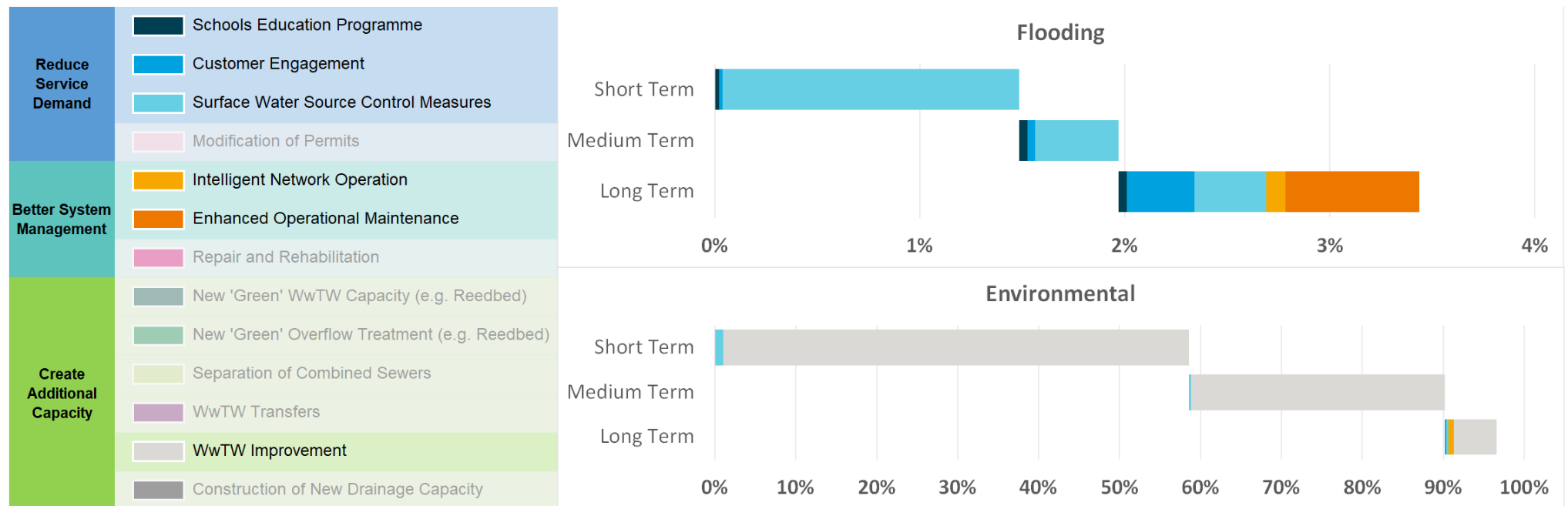
- Arlecdon
- Calder Bridge
- Ennerdale Bridge
- Haile
- Pica
- Seascale
- Ullcoats
- Kirkland

Around 97% of the potential investment in these small TPU will be to address environmental risks, and 3% could be to address flooding risks (Figure 25).

All short and medium term investments in these small TPUs could be through wastewater treatment improvement, surface water source control measures, and schools and customer engagement programmes.

In the longer term, we could additionally invest in the installation of intelligent network operation systems and enhanced operational maintenance programmes.

Figure 25 Short, medium and long-term investment in TPUs with population less than 2,000 (Ehen Calder sub catchment) distributed by option type



5.3.9 TPUs with population less than 2,000: Irt-Mite-Esk-Annas sub catchment

The following TPUs each have a population of less than 2,000, and have therefore been grouped together:

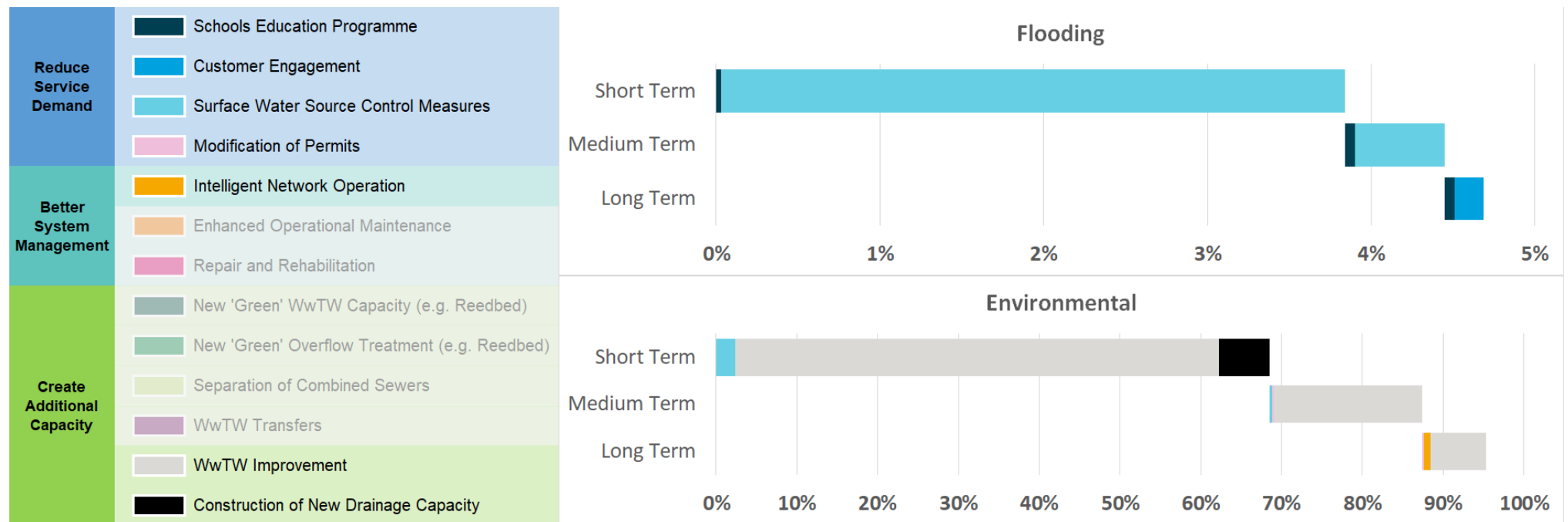
- Bootle
- Gosforth
- Bootle/Hycemoor
- Greengarth and Holmrook
- Drigg Tanks
- Ravenglass
- Eskdale Green
- Esk-Meals

Around 95% of the potential investment in these small TPU will be to address environmental risks, and 5% could be to address flooding risks (Figure 26).

All short and medium term investments in these small TPUs could be through wastewater treatment improvement, surface water source control measures, construction of new storm water drainage capacity, and schools education programme.

In the longer term, there could be investment in the installation of intelligent network operation systems and customer engagement programmes.

Figure 26 Short, medium and long-term investment in TPUs with population less than 2,000 (Irt-Mite-Esk-Annas sub catchment) distributed by option type

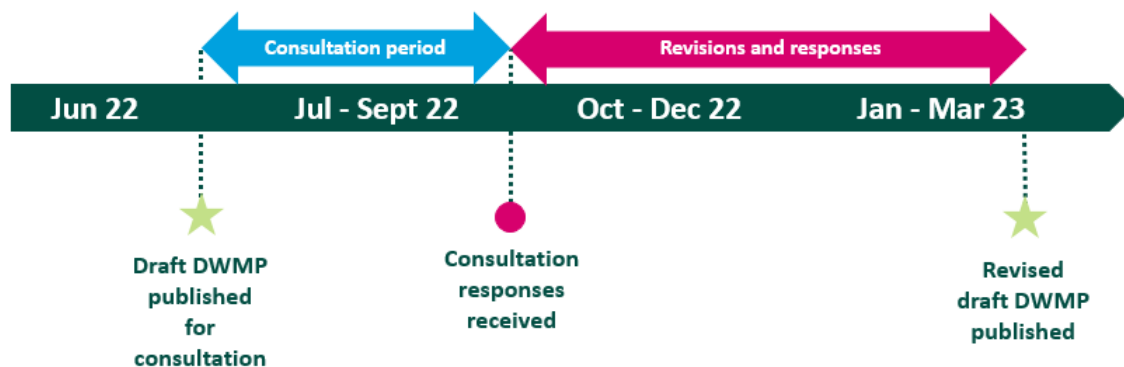


6. Next steps

The DWMP is inherently not a static plan so we will continue to work with stakeholders to develop partnership options and strategies which will make a difference within the South West Lakes SPA.

We are currently at draft publication (Figure 27) and between now and final publication in March 2023, we will reflect on updated guidance such as WINEP and storm overflows, and incorporate the feedback that we receive to ensure that the DWMP can build the best foundation to allow the North West to thrive in years to come.

Figure 27 Timeline between draft and final publication



We welcome your feedback on our draft publication of our first DWMP. Please get in touch using our mailbox:

DWMPConsultation@uuplc.co.uk

7. References

- [1] <https://environment.data.gov.uk/catchment-planning/ManagementCatchment/3085>
- [2] <https://environment.data.gov.uk/catchment-planning/OperationalCatchment/3145>
- [3] <https://environment.data.gov.uk/catchment-planning/OperationalCatchment/3167>
- [4] <https://environment.data.gov.uk/catchment-planning/OperationalCatchment/3231>
- [5] <https://environment.data.gov.uk/catchment-planning/v/c3-draft-plan/CatchmentPartnership/WEIF6701>
- [6] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/507122/LIT_10210_NORTH_WEST_FRMP_PART_B.pdf
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- [8] <https://www.gov.uk/government/publications/surface-water-management-plan-technical-guidance>
- [9] <https://westcumbriacatchmentpartnership.co.uk/>
- [10] <https://btob.scrf.co.uk/south-cumbria-catchment-plan>

8. Appendix

Table A.1 List of TPUs which did not trigger for RBCS across environment, flooding or wastewater treatment works categories

TPU Name	Environment	Flooding	Wastewater Treatment Works
Bank House Kirkby	Not triggered in RBCS	Not triggered in RBCS	Not triggered in RBCS
Drigg Tanks	Not triggered in RBCS	Not triggered in RBCS	Not triggered in RBCS
Eskdale Green	Not triggered in RBCS	Not triggered in RBCS	Not triggered in RBCS
Greenscoe	Not triggered in RBCS	Not triggered in RBCS	Not triggered in RBCS
Kirkland	Not triggered in RBCS	Not triggered in RBCS	Not triggered in RBCS
Marion (Ulverston)	Not triggered in RBCS	Not triggered in RBCS	Not triggered in RBCS
Pica	Not triggered in RBCS	Not triggered in RBCS	Not triggered in RBCS
The Green	Not triggered in RBCS	Not triggered in RBCS	Not triggered in RBCS
Ullcoats	Not triggered in RBCS	Not triggered in RBCS	Not triggered in RBCS
Waingate Bridge	Not triggered in RBCS	Not triggered in RBCS	Not triggered in RBCS

United Utilities Water Limited / United Utilities Group PLC
Haweswater House
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP
unitedutilities.com



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