

United Utilities

Ongoing AMP6 and future AMP7
Programme of Investment

31st January 2018



AMP 6 Background and Drivers

Development of our plan – ODI's

Under the 5 customer promises sit 11 outcomes

We have made a public commitment to delivering these outcomes

Under the outcomes sit measures of success

We have set out performance commitments for each of these measures

21 measures have a financial outcome delivery incentive (ODI) associated with them



Types of measures

- Delivery – Measures where the performance commitment is directly linked to delivery of a project within our capital programme and agreed with one of our quality regulators i.e. river improved measure. These provide a river improved length which is counted towards the ODI on delivery of the scheme in the National Environment Programme. The km of river improved was set at PR14 and there is limited flexibility to change schemes mid-AMP
- Performance measures – Measures where the performance commitment is linked to a level of performance that we are required to deliver for our customers i.e. average minutes supply lost per property
- Index measures – Some of the commitments associated with performance measures are made up as a number of sub-measures, these are combined into a single target weighted on the basis of customer willingness to pay i.e. sewer flooding index

AMP 6 Programme overview - Cumbria

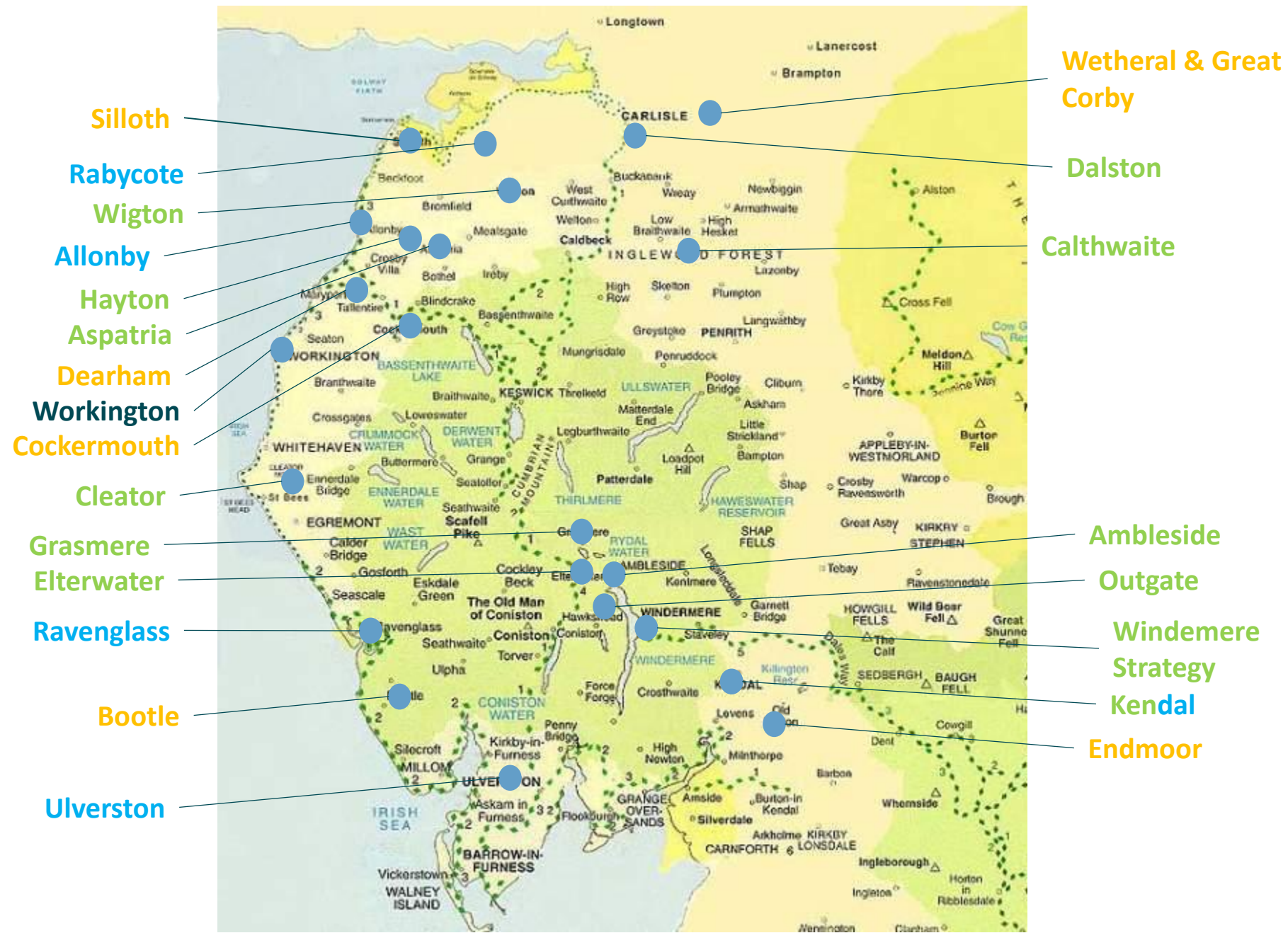
Headlines

- £170m of major capital projects
- 130 km of rivers improved
- 77 km of rivers protected
- Projects at 5 WwTW to improve shellfish/bathing waters
- Approx. £10m of capital projects for maintenance
- Flooding recovery work



Cumbria Wastewater Services AMP6 Major Capital Projects High Level Overview

Key Bathing waters/shellfish Supply and demand WFD improvements Sludge



Windermere Catchment Strategy

Contract awarded to delivery partners Dec 2015.

Started on site for first year of pipeline works in A592 completed winter 2016/17. Second season in construction now.

Intensive public and media attention

Significant innovative solution design elements including advance P removal

Driver - Windermere	Biodiversity
Regulatory Date	31/3/20
Consent change expected	Windermere 65% TP load removal - equivalent to 0.25mg/l annual average TP Ambleside 22% TP load removal - equivalent to 0.5mg/l annual average TP Glebe Road Pumping Station spill frequency < 30x pa
Total Project Cost	>£40m



The Great North Swim on Lake Windermere

Windermere Catchment Strategy



Upgrade to Ambleside WwTW (Q&X)

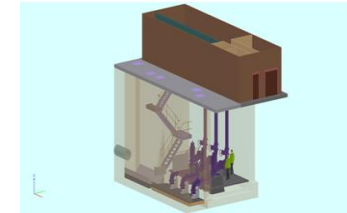


Indicative permit
0.5mg/l TP



Reduce spills to <math><30/a</math>

Upgrade to Glebe Road



6.5km rising main constructed in highway
Flows from GR increased from 70l/s to 400l/s



Indicative permit
0.25mg/l TP



Upgrade to Windermere WwTW (Q)

Supply and Demand – Bootle and Endmoor WwTWs

- Bootle WwTW is a small rural trickling filter works serving a population equivalent 337 of discharging into Syke Beck which is a tributary of the River Annas.
- Confirmed and ongoing development in catchment will increase PE by 30%
- Current high level solution includes modifications to inlet and trickling filters

Driver	Supply and Demand
Delivery date (OFWAT)	31/3/19
Consent change expected	No change to existing
Cost	<£5m



- Endmoor WwTW is a trickling filter works serving a population equivalent of (PE) 786 discharging into the Peasey Beck.
- Known proposed development forecast to increase PE by 38%
- Project in early stages of delivery with ongoing flow and load surveys. Scope likely to include a blended treatment option to with modifications to primary and secondary settlement capacity.

Driver	Supply and Demand
Delivery date (OFWAT)	31/3/19
Consent change expected	To be confirmed
Cost	<£5m



Kendal WwTW

- Kendal WwTW is the main treatment facility for the Kendal area servicing a large residential and tourist population equivalent of 82,384, discharging to the River Kent. The works was severely impacted by Storm Desmond as the outfall was washed away
- Two AMP6 drivers, Shellfish and No Deterioration, will deliver enhanced treatment providing final effluent UV and new Nereda activated sludge technology.
- No deterioration is driven by the forecast increase in population from local development taking population equivalent up to 92,897.
- Contract awarded to our delivery partner, LIMA, Oct 2016, start on site Feb 2017. Kendal final effluent UV brought into effective use Dec 17.
- Kendal outfall has been reinstated to temporary location with full reinstatement back to original location summer 2018

Driver	Shellfish
Regulatory Date	31/12/17
Consent change expected	Final Effluent UV
Cost	<£5m



Driver	No Deterioration
Regulatory Date	31/3/19
Consent change expected	NH4 from 8 to 5mg/l
Cost	>£10m

Ravenglass WwTW

Ravenglass WwTW serves the village of Ravenglass, located on a natural harbour on the west coast of Cumbria discharging primary treated screened effluent to the tidal section of the River Esk.

It lies within the boundary of the Lake District National Park. It has a population equivalent of 199 and has a 150 mg/l suspended solids consent.

The site has a significant number of constraints that make solution delivery difficult :- access is across the beach, saline intrusion, area on headland surrounded by archaeological remains, ecologically sensitive, tourism pressures.

Network relining was completed 2015 and has returned the site to DWF compliance and reduced saline intrusion and infiltration.

Innovative secondary treatment and final effluent UV treatment with storm water storage completed and brought into effective use Dec 2017

Driver	Shellfish
Regulatory Date	31/03/18
Consent change expected	Final Effluent UV and 10 spills pa
Cost	<£5m



Ulverston WwTW

Ulverston WwTW serves a Population Equivalent of 14,996 and is located 1.3 miles South of Ulverston town centre.

The final effluent is discharged via an outfall pipeline running through Glaxo Smith Kline land into the Leven Estuary.

The Shellfish driver requires reduction of spills from storm tanks, agglomerated with spills from a network CSO, to 10 spills per annum (from average annual spill frequency of 120+).

Scope to include increasing FTFT from 170l/s to 420l/s and 4000m³ storage in the network.

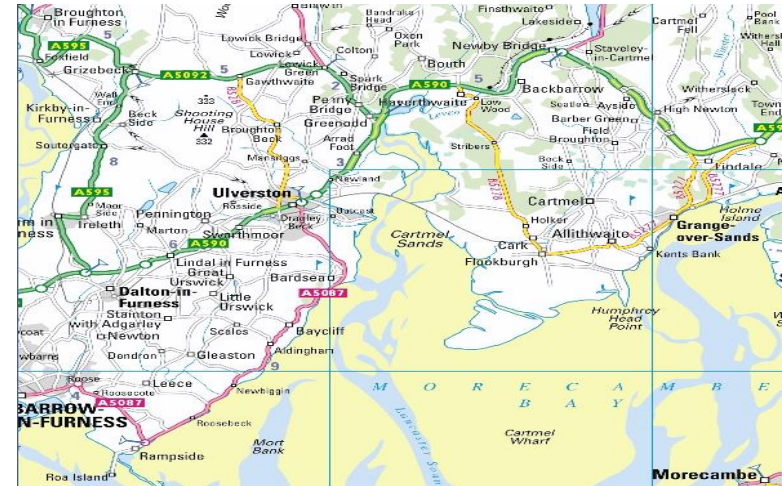
Solution scope dependent on reduction in network infiltration, potentially achieved in large part by watercourse culvert relining and improvement works currently being undertaken by EA.

Land acquisition issues and trade effluent requirements from GSK now resolved.

Design accounts for proposed development in order of 3000 homes in catchment.

Contract awarded and started on site at WwTW Dec 2017, in Network May 2018.

Driver	Shellfish
Regulatory Date	31/03/19
Consent change expected	10 spills per annum
Cost	>£20m



Grasmere WwTW

- Grasmere WwTW serves Grasmere village in the Lake District National Park with a population equivalent of 2,428 (719 resident) that varies due to tourism. The whole catchment suffers extensively from high ground water table with 93% of Formula A flows to works being infiltration.
- Phased strategy was to return works to DWF compliance by removing infiltration from network followed by updated flow and load survey to inform detailed design for WwTW solution.
- Past 18 months spent identifying infiltration hotspots, attempting to reline sewers and divert SW connections. This is proving almost impossible due to high water table.
- Chemical Investigation Trials (CIP2) currently ongoing to look at use of existing COUFs for advanced TP removal which will inform solution.

Driver	Biodiversity
Regulatory Date	31/3/20
Consent change expected	40% TP load removal Return to DWF
Cost	<£5m

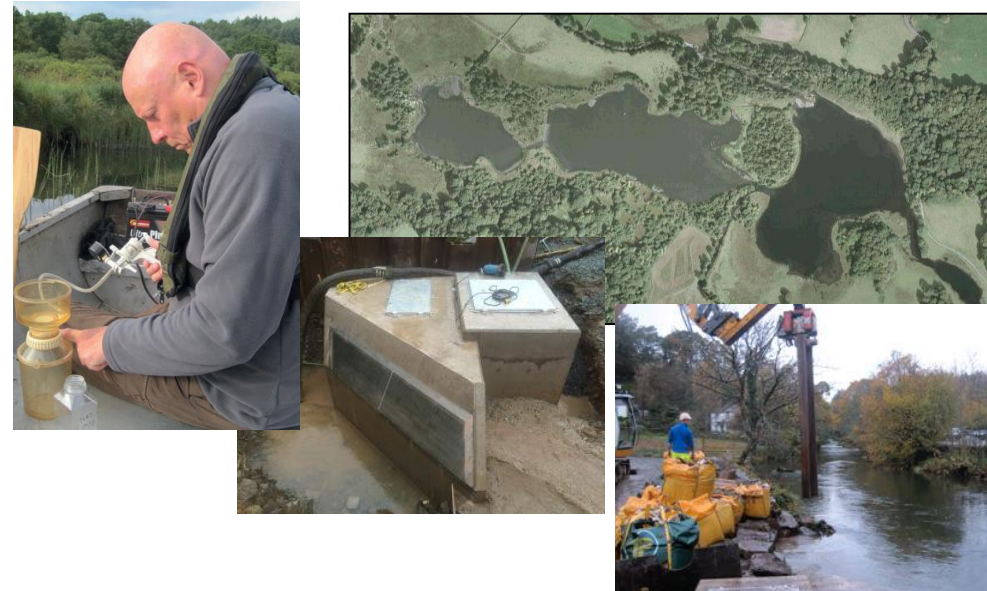


- High level scope and solution principles agreed with EA in Nov 2017. Now driving towards Contract Award summer 2018. Solution likely to meet the TP load removal requirements likely to be a blended treatment solution with a proportion of the flow receiving retrofit advance P removal

Elterwater Basins Water Quality Improvements

- Three basins at Elterwater are eutrophic and declining in biodiversity
- Legacy issues with phosphorous in sediments partially due to historical Ww discharges prior to 1990's as demonstrated by UU funded investigations in AMP5
- Low tech, non intrusive catchment solution implemented ongoing WQ sampling and monitoring
- Little Langdale Beck redirection and Gt Langdale Beck diversions via new intake structure on river bank and short pipeline to head of Inner Basin aiming to prevent stratification of basin, and reduce retention times in basins
- Working in partnership with South Cumbria Rivers Trust, NE, EA and local landowners

Driver	Biodiversity
Regulatory Date	31/3/17
Consent change expected	Water Quality monitoring and catchment interventions
Cost	<£1m



- Work completed and been in effective use since Oct 2016. Initial results would suggest the interventions are effective. Ongoing monitoring through SCRT and the UU supported repeat of sediment surveys in Spet 2019 will inform the future need for the maintenance of this intervention

Outgate WwTW

- Outgate WwTW is a tiny, isolated filter plant serving a resident population of 49 people. There is no power or permanent access to site. Final Effluent discharges to Outgate Beck which is one of 5 tributaries to Blelham Tarn.
- Following catchment source apportionment studies it was shown that Outgate WwTW does contribute to the eutrophication issues in Blelham Tarn
- NEP required annual average TP of 2mg/l
- Assessed scope for catchment solutions but WwTW main source on this tributary
- EA challenge to look at innovative and sensitive ways of achieving this standard in this location
- Outcome of Petteril catchment trials of enhanced reed beds and active media has informed the preferred solution. Due to start on site this autumn to construct an active media bed with bark pH correction

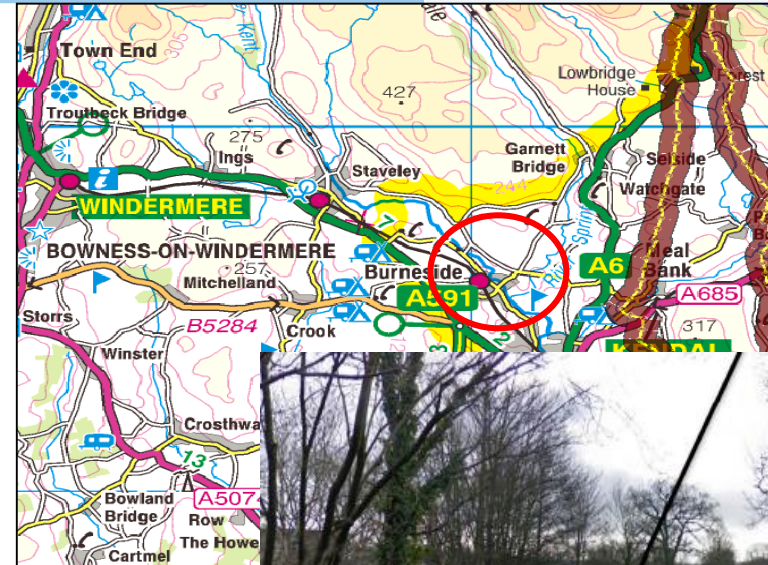
Driver	Investigation/Biodiversity
Regulatory Date	31/3/19
Consent change expected	2mg/l TP annual average
Cost	<£1m



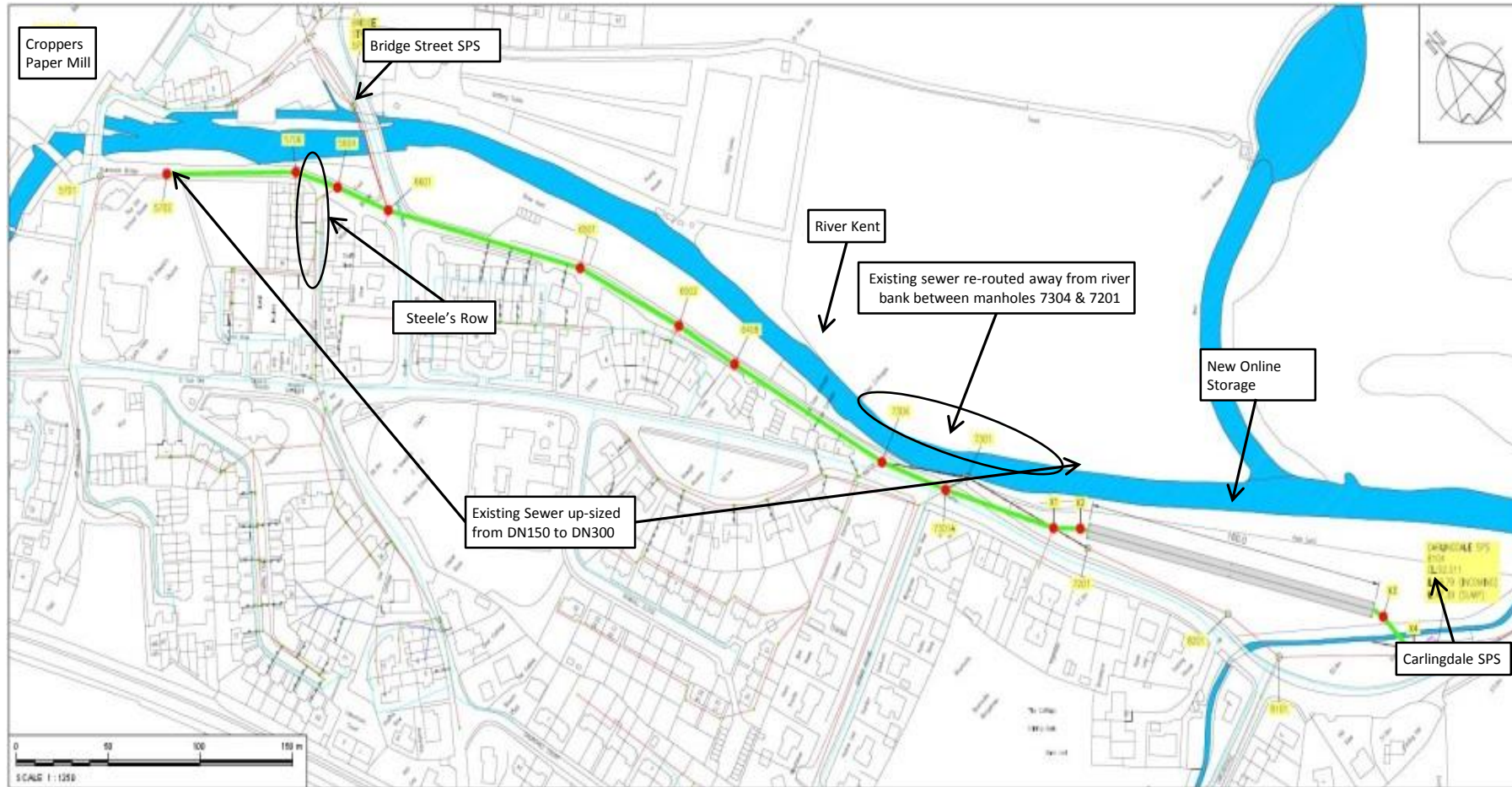
Burneside Steeles Row Flooding

- Burneside village is to the north of Kendal and forms the head of the Kendal drainage network
- External flooding from a manhole on Steeles Row, outside a bus-stop that runs overland into highway drainage to River Kent in extreme wet weather
- Committed to solution within AMP6 to Tim Farron MP, Parish Council and residents
- Solution will involve upsizing of sewer from Steeles Row to Carlingdale Pumping Station and storage
- Efforts being made to minimise storage volumes by removing some SW connections and infiltration

Driver	External Flooding/Pollution Incidents
Regulatory Date	31/3/20
Consent change expected	1 in 30 yr storm flooding protection
Cost	<£5m



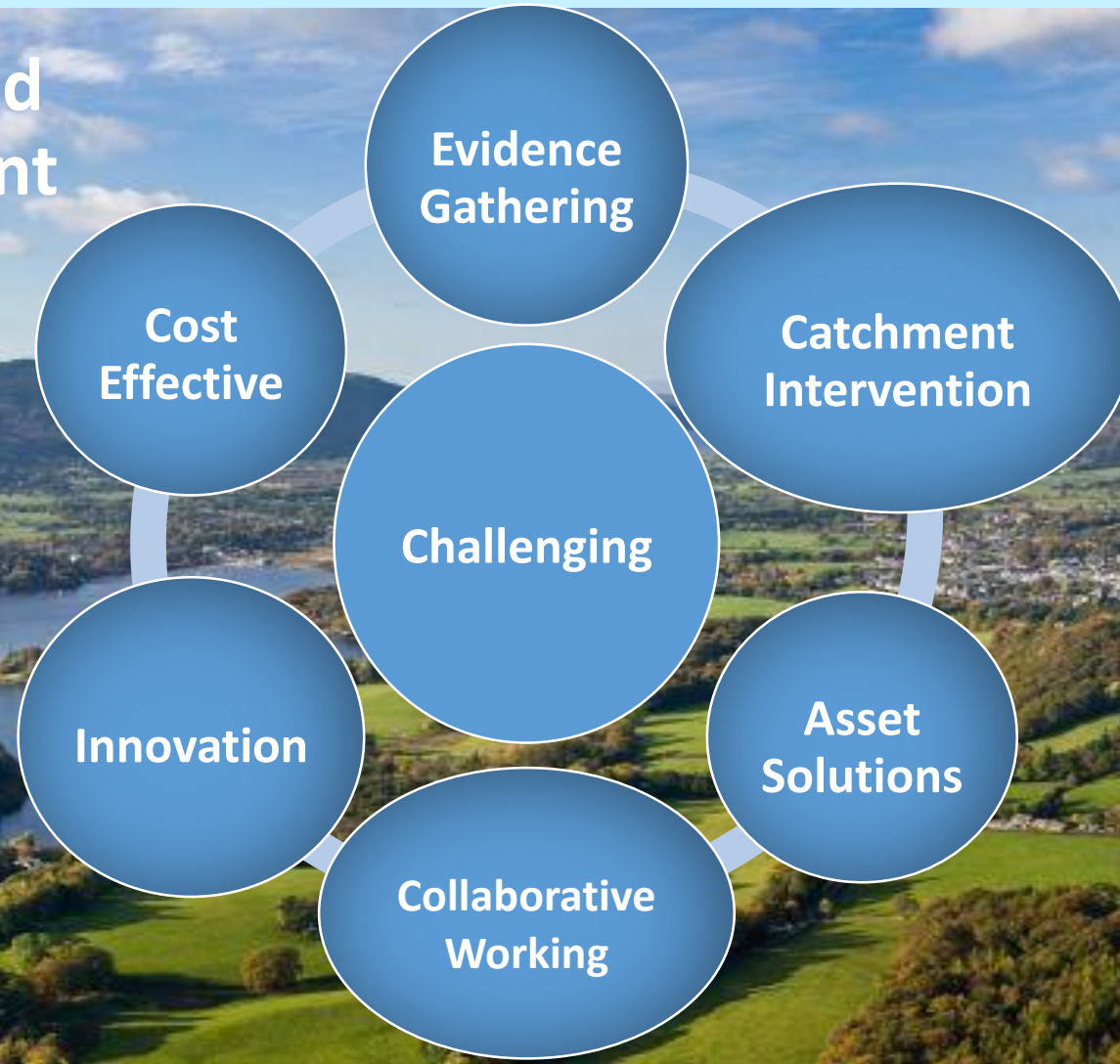
High Level Solution for Steeles Row/ Burneside



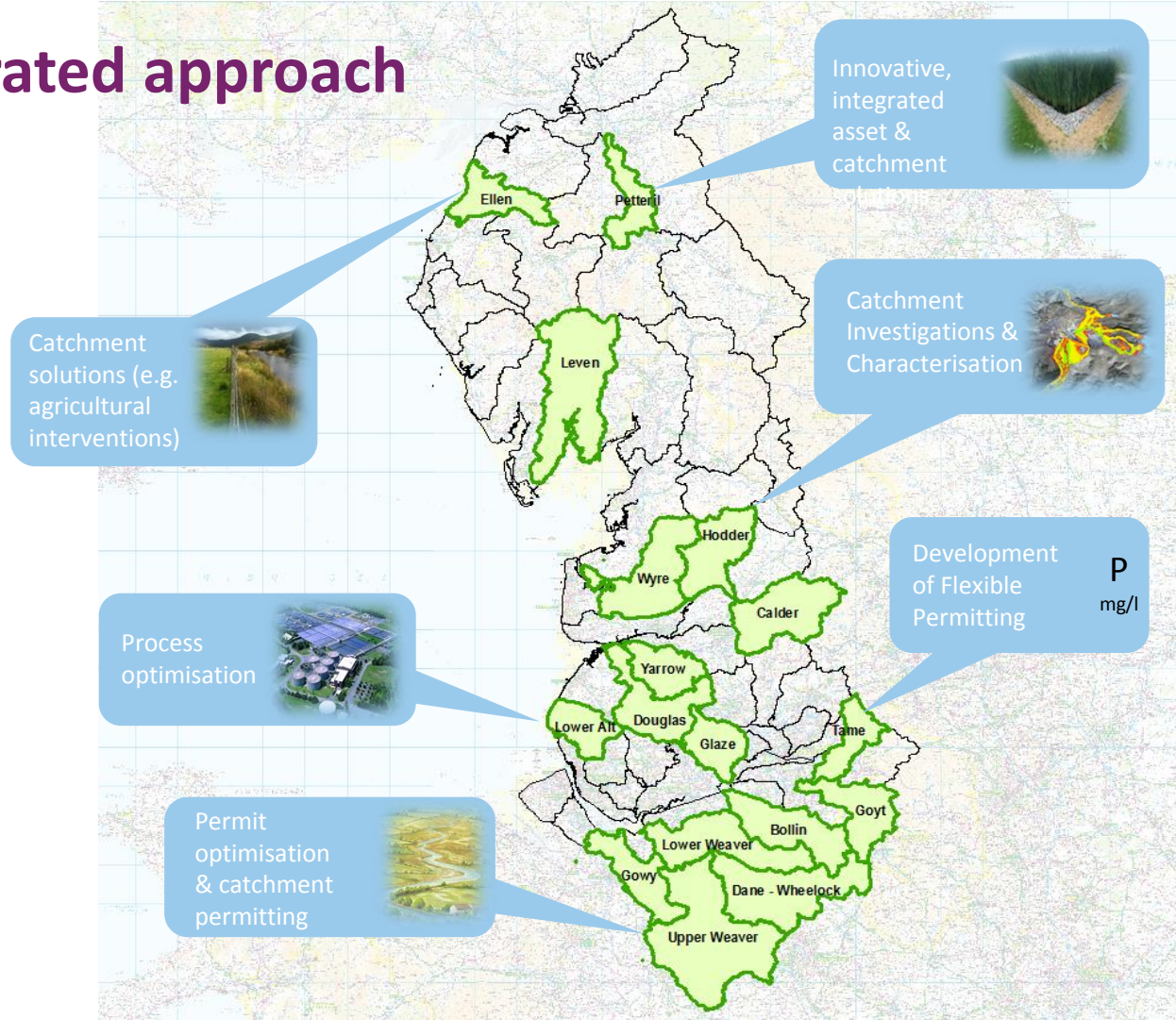
Integrated Catchment Approach

Risk Based, Evidence Based Approach
Promotion as the way forward in AMP7

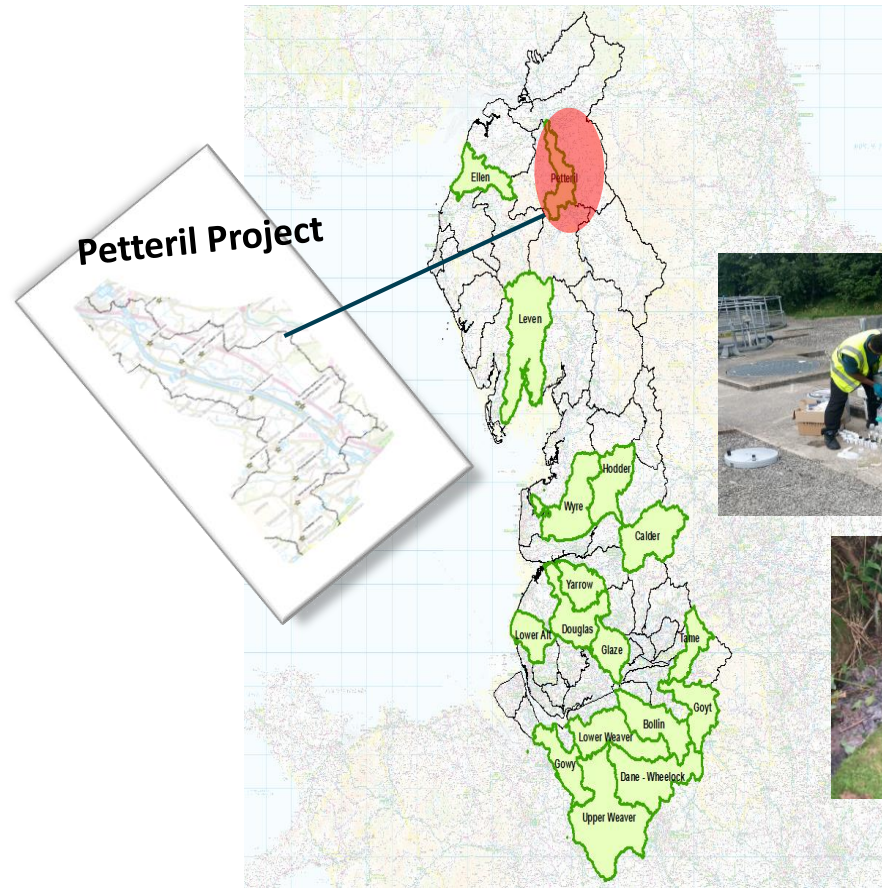
Integrated Catchment Strategy



Embedding an integrated approach in future solutions



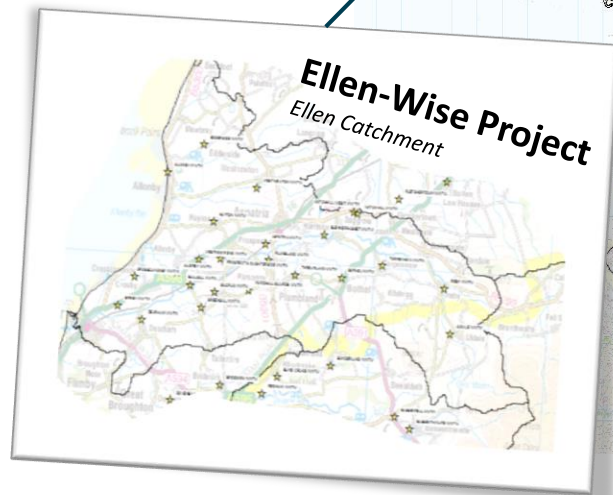
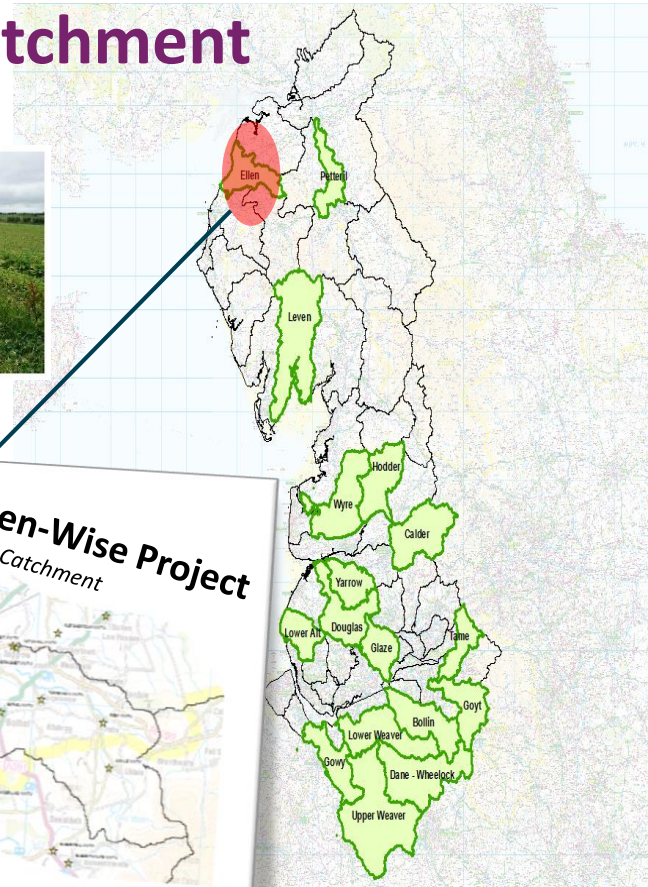
The Petteril Catchment



A truly integrated approach:

- **Evidence gathering** – Investigations and monitoring. Identifying pollution hotspots in the catchment. Benchmarking.
- **Collaborative approach** – partnership work and stakeholder/customer/community engagement
- **Innovative** – sustainable, cost beneficial, combining asset solutions and catchment interventions to:
 - reduce phosphorus pollution across the catchment
 - mitigate flood risks
 - reduce carbon footprint
 - Customer/local community engagement

The Ellen catchment



Catchment solutions such as:

- Riparian buffer strips
 - Improved slurry storage
 - Fencing
 - Farming behaviour
- **Off-setting capital costs and environmental impact of traditional end-of-pipe solutions**
 - **Quantifying the benefits of catchment interventions**



Before



After

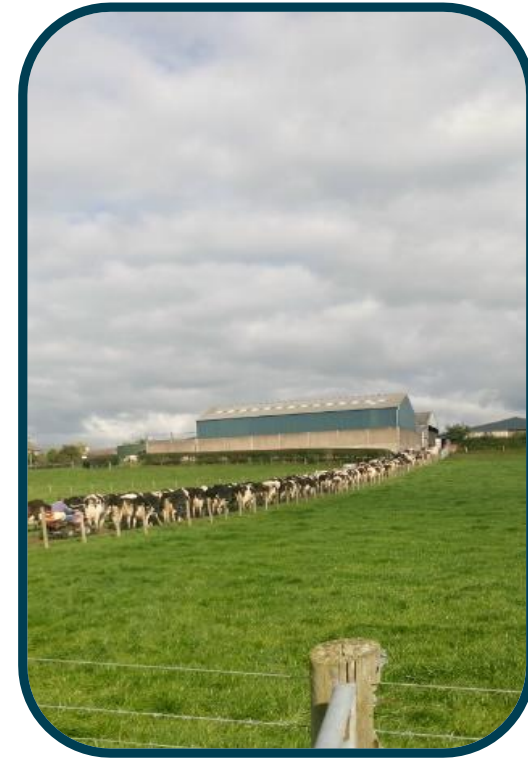
Collaborative Working Required

- Promotion with regulators
- Customer engagement
- Promotion across industry
- Natural Capital
- Catchment Pioneer
- Flood risk management
- Water quality catchment interventions
- Education programmes
- Research and innovation



Next Steps

- Engagement & promotion of an integrated approach across identified catchments:
 - Scenario planning activities to scope out most feasible integrated scenarios to be costed up and developed as solutions for PR19
 - Engage with the EA and key stakeholders to develop a partnership approach to delivery of these solutions
- Challenging uncertainty and engaging with regulatory evidence
- Buy-in to flexible permitting & innovative asset solutions
- Review evidence and plan interventions collaboratively to improve our catchments



Timeline to AMP7

- WINEP – Water Industry National Environment Programme – version 3 released in March 2018
- This continues to inform our AMP7 business plan alongside extensive and ongoing communications directly with local and national EA
- Company Business Plan submission to OFWAT in September 2018 with Final Determination in 2019
- However, final WINEP/River Basin Management Plan lock down with Ministerial approval not until 2021
- Potential for variation and change against the assumptions made for AMP7 Business Plan
- The ODI targets and thresholds for penalty and reward, and agreements around released funding for specific outcomes are being negotiated with OFWAT with mechanisms for flexibility and change. An improvement on our AMP6 contract as lesson learnt that we need the opportunity to make swaps and changes as the needs and drivers can vary throughout the AMP
- Likely AMP7 activities in South Cumbria
 - Catchment Investigations to inform AMP8 needs
 - Kendal No Deterioration – total phosphorous
 - Extension of the catchment based approach learning from the Petteril and Ellen work with development of Natural Capital accounting