The Future of Asset Resilience and Capital Maintenance

Agenda

09:30 – 10:00	Registration, breakfast and networking
10:00 – 10:10	Welcome and overview of the day with Bridget Rosewell
10:10 – 10:25	Resilience standards and asset health in the water sector with Jim Hall
10:25 – 10:30	Asset health and the regulatory reset: approach in the White Paper and Transition Plan with Helen Edmundson, Defra
10:30 – 10:50	Asset Health Roadmap and AMP8 cost change with Matt Hateley and Daniel Mitchell, Ofwat
10:50 – 11:05	New guidance on Water Sufficiency with Nicholas Adjei, DWI
11:05 – 11:25	Panel discussion 1 and Q&A moderated by Bridget Rosewell
11:25 – 11:50	Coffee break
11:50 – 12:10	Insight overview: estimating sustainable asset replacement expenditure in the water industry with Asatha Mantri, Economic Insight
12:10 – 12:40	Resilience standards for asset health with Matt Humphrey, Anglian Water, and Nic Francis, Reckon
12:40 – 12:55	Panel discussion 2 and Q&A moderated by Bridget Rosewell
12:55 – 13:00	Summary and close with Bridget Rosewell
13:00 – 14:00	Lunch

Welcome and overview

Bridget Rosewell

Resilience standards and asset health in the water sector

Jim Hall

Resilience standards and asset health in the water sector

Helen Edmundson

Defra

The Future of Asset Resilience and Capital Maintenance Event

Daniel Mitchell, Interim Director – Cost Assessment
Matt Hateley, Director – Engineering and Asset Management

4th March 2026

Ofwat

Why we regulate: Protecting consumers, the environment, and the future of water

- Our work starts with clear **legislative duties**—protecting consumers, ensuring companies carry out their statutory functions effectively, maintaining financial stability, and securing long-term resilience for the sector. We also have secondary duties e.g. contribute to sustainable development. We must also have regard to the desirability of promoting economic growth" when exercising our regulatory functions

- To deliver on these duties, we've set strategic goals focused on **driving performance, meeting long-term challenges, and delivering real value for customers, communities, and the environment.**

- And that's why we monitor the performance of the sector **across six key** areas. Each team's objective is **directly tied to our duties and goals,** ensuring all our work is targeted and fully aligned with our statutory responsibilities.

Our legislative duties under section 2 of WIA91

Protect Consumer Interests: Promote effective competition to safeguard consumers.

Ensure Proper Functioning: Ensure water companies and licensees properly carry out their statutory functions.

Financial Stability: Ensure water companies can finance carrying out those statutory functions properly.

Resilience: Secure long-term resilience of water supply and wastewater systems.

Our strategic goals align with our legislative duties

To transform water companies' performance

To drive water companies to meet long-term challenges through increased collaboration and partnerships

For water companies to provide best value and outcomes for customers, communities and the environment

To deliver these goals and fulfil our duties, we monitor performance of the sector through six areas

Financial Resilience: Monitoring the resilience risk so companies can deliver for customers now and in the future.

Asset Management improving sector wide understanding of asset health to safeguard long-term water and wastewater services.

Customer Policy: Protecting consumer interests and driving better outcomes for customers.

Operational Performance Driving high standards and continuous improvement in companies' day-to-day delivery.

Investment Delivery Overseeing effective use of investment to meet statutory and environmental goals.

Sector Governance Ensuring strong governance so companies fulfil their statutory and public duties.

Daniel Mitchell

Capital maintenance cost assessment – looking back and forward

Benchmarking models were the starting point of capital maintenance PR24 cost assessment

Our **PR24 base expenditure models built on the models used in PR19, made up of opex and capital maintenance.** They were the starting point of base cost assessment.

Models were consistent with our PR24 base cost principles, and aimed to capture the key exogenous cost drivers of base costs.

We reflected forward looking cost pressures in base expenditure allowances in 3 ways:

- Cost driver forecasts
- Cross-checking allowances against business plan forecasts
- Cost adjustments, including 6 sector wide cost adjustments:
  - Mains replacements
  - Meter replacements
  - P-removal
  - Net zero
  - Energy
  - Network reinforcement

We made £3.9 billion of forward looking and company-specific cost adjustments (versus £0.3 billion in PR19).

Overall, PR24 base allowances totalled £60.1 billion, which is 19% higher than PR19 base allowances, and 7% more than what companies spent over the 2019-24 period.

Figure: PR24 base cost principles

1 - Use good quality data

2 - Consistent with engineering, operational and economic rationale

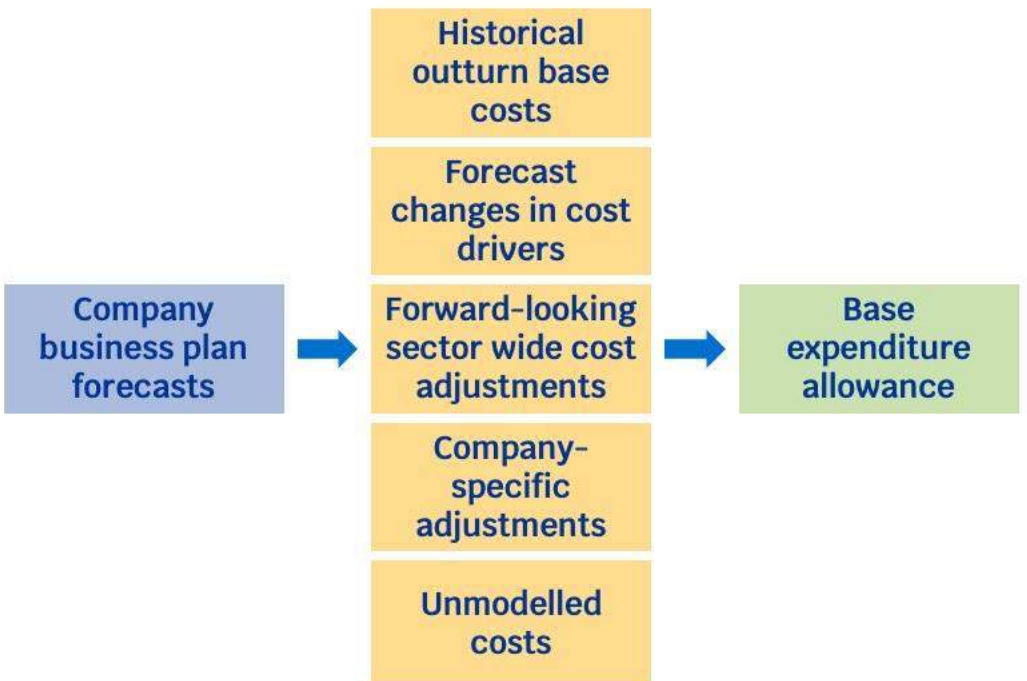
3 - Sensibly simple and transparent

4 - Focus on exogenous cost drivers

5 - Robust econometric cost models

6 – Set a stretching but achievable cost efficiency challenge

7 – Coherent cost assessment approach that drives the right incentives



Roadmap to enhancing asset health understanding

- **Collaborative approach to asset health**: Working with the sector to strengthen understanding of asset health as a foundation for long-term resilience.
- **Targeted initial focus**: Initial scope prioritises key asset classes where there are known asset health issues / concerns, and companies can provide robust evidence in 2025–27.
- **Clear route to additional allowances**: PR24 cost change process provides a mechanism for timely, evidence-based additional capital maintenance allowances, with scope for in-period or end-of-period revenue adjustments.
- **Expanding scope over time**: A consultation later this year will consider extending the asset health reopener to a wider range of asset classes.
- **Shift in regulatory approach**: Proactive engagement and transparency support a more supervisory, less adversarial model of regulation.

Condition data collected as proportion of the asset base, based on Modern Equivalent Asset Value (MEAV)

PR24 data coverage
70%

→

Roadmap coverage
~80% (can increase following consultation later this year)

→

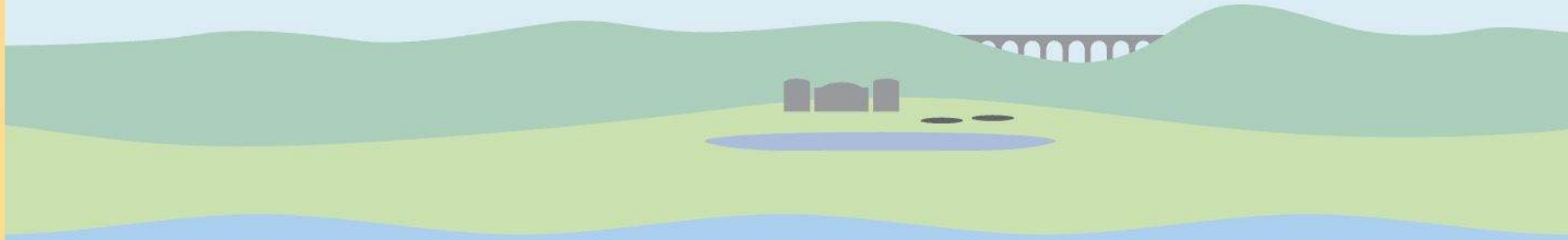
PR29 and beyond
Further data collection

Initial list of priority assets for additional data collection
Network storage (service reservoirs, water towers and contact tanks
Water boreholes
Water treatment civils: rapid gravity filters
Wastewater treatment civils: activated sludge tanks, settlement tanks, and trickling filters
Gravity sewers

Roadmap to enhancing asset health understanding: Looking back, looking forward

Key deliverables during 2025

Close collaboration with the sector to start to develop an improved and consistent understanding of asset health and condition	Developed condition methodologies to support current and future data collection – feeding into a better understanding of asset health	Agreed definitions for understanding cost and workload – which can be used to support future cost assessment and ringfencing of allowances	Issued data requests, providing greater oversight of what companies have delivered and the current state of the assets	Established a process that will enable companies to request additional asset health related funding during the 2025-30 period



Key areas of focus in 2026 that will further our asset health agenda

Asset inventory: Developing a common understanding of assets to support with future data collection, and assessment of health. Also, the approach to cost assessment and the ringfencing of allowances.	**Forward looking metrics (NARM pilot):** Continuing to explore the feasibility of developing a robust forward looking asset health metric in the water sector.	**Cost change process:** Allows companies to submit investment cases for additional asset health investment for the priority assets, with a potential to expand the scope in advance of the next PR.	**APR reporting:** Enhanced data collection during the 2025-30 period to support monitoring of AMP8 investment, and support with developing the approach to cost assessment.	**AMMA:** Delivering an updated AMMA to have a more recent view of company asset management maturity and steps to improve that over time.	**Collaboration:** Continued collaboration on the asset health roadmap, and on the approach to capital maintenance allowances and asset health at future price reviews.

Key IWC recommendations related to capital maintenance

5. Water industry planning should be rationalised down from 9 plans into **2 core planning frameworks.**

18. The regulator should adopt a more **'supervisory approach'** to regulating individual companies. The regulator should give broadly equal weight in its judgements to the evidence and information it has gained through the supervisory engagement with firms and from objective econometric modelling.

19. The regulator should ensure funding directed appropriately to maintain assets by **clearly defining and ring-fencing base capital expenditure, base operating expenditure, and enhancement capital expenditure allowances**.

20. Following the establishment of a new methodology for assessing asset condition and expected life, the regulator should consider **the merits of linking RCV-run off more closely to economic depreciation** of assets.

67. The UK and Welsh Government should **strengthen the requirements on companies to map and assess the health of their assets**, and the regulator should **ensure metrics for asset health are sufficiently forward looking**.

68. **The regulator's oversight of infrastructure resilience and asset health should be strengthened**, under its supervisory approach.

78: A review of the current PCD framework should be completed before the end of AMP8 to inform a more robust and flexible approach, broadly set at programme level spending.

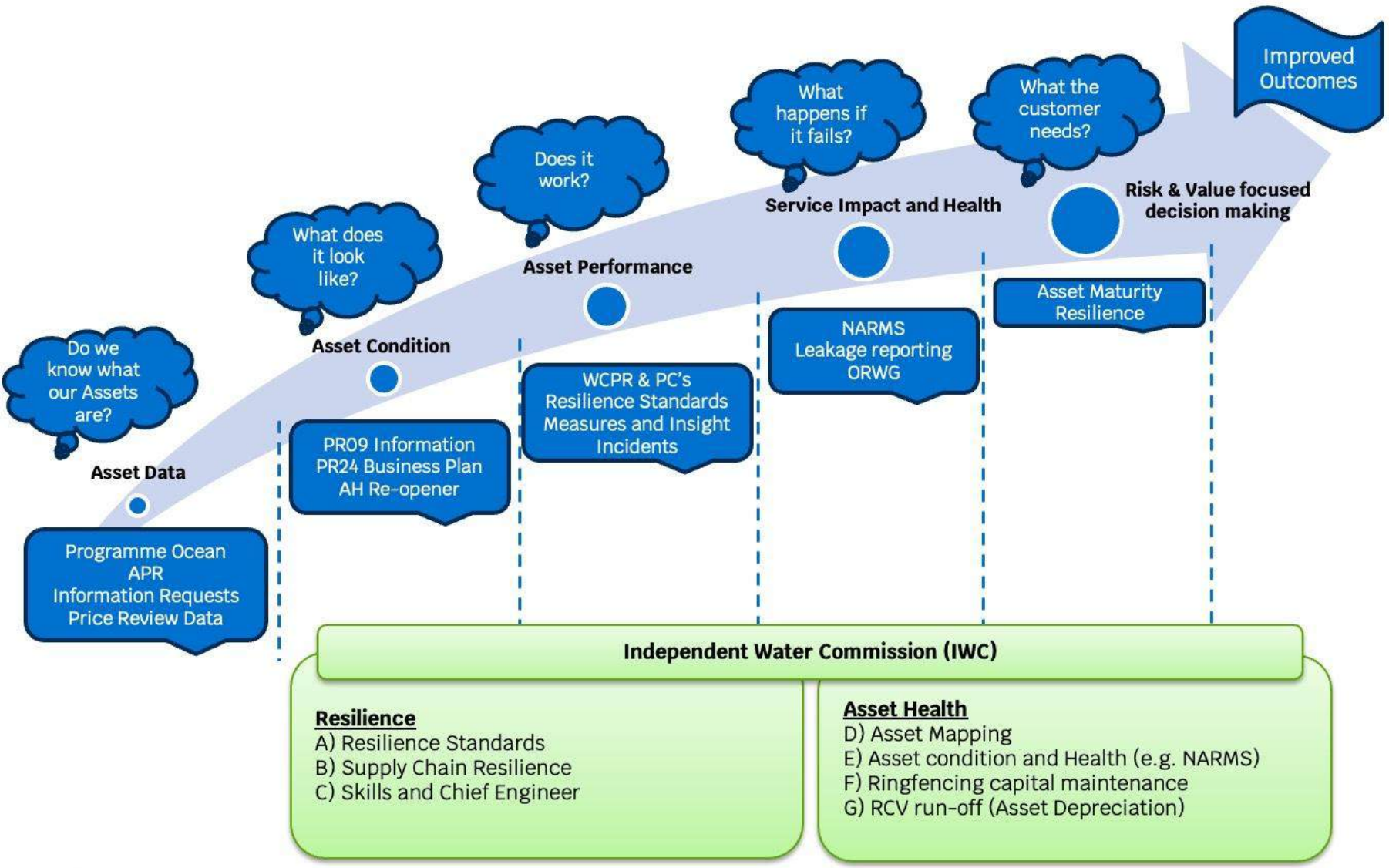
- **PCDs should cover asset renewals as well as enhancement**, but not opex.

Capital maintenance cost assessment for PR29: emerging thinking

- **Greater transparency** is needed on how companies are investing capital maintenance allowances, and stronger confidence that funding is being directed to the right areas.
- We have started work to explore **how a more supervisory approach to economic regulation could better inform the setting of cost allowances at PR29**.This could involve richer and more varied engagement with companies across the price control period, providing an additional tool to address information asymmetry and support high-quality business plans, alongside established economic incentives such as cost benchmarking and business plan quality incentives.
- **The Asset Health Roadmap is a key enabler**. Sector-wide information on asset condition, historical costs and workloads, and forward-looking asset deterioration models (eg NARMs) can support companies to develop well-evidenced capital maintenance plans, clearly linking proposed investment over the next five years to long-term asset health outcomes.
- **We are committed to working collaboratively** with water companies, Defra, the Welsh Government, other regulators, and wider stakeholders to develop our approach to setting capital maintenance allowances at PR29.
- **No options are off the table**, and we look forward to engaging with the sector to explore options and issues, building on the work undertaken by Reckon for Water UK in 2024.
- **There is much to learn from other regulators**, including:
  - Ofgem's use of Network Asset Risk Metrics (NARMs) as a more flexible price control deliverable
  - More granular assessment of capital maintenance investment by asset class, enabled by the development of the common asset inventory for companies to map asset data
  - Wider use of capital maintenance price control deliverables to strengthen accountability for delivery

Matt Hateley
Asset Health / Cunliffe
NARMS

Regulatory Landscape – Asset Health and the Independent Water Commission (IWC)



Key Ofwat Workstreams

Asset Management – Licence, AMMA and visits
We consider that advanced AM within the water sector will promote optimised decision making, driving sustainable performance and outcomes. We are consulting on a new AM licence condition, undertaking our Asset Management Maturity Assessment (2026) and continuing our annual Asset site visits.

Asset Health Re-opener
We want to accelerate the sector's understanding of asset condition. We will make cost adjustments during the 2025-30 period if we identify sector wide asset condition issues that can be addressed by 31st March 2030.

Network Asset Risk Measures (NARMS)
We want to drive better understand current and future asset performance (and risk to service) using a consistent approach and are reviewing the use of NARMs (used in energy) as a potential approach

Asset Inventory
We want to improve reporting accuracy and enable more granular analysis in future by driving consistency. Having common definitions and classification of what constitutes a site, asset, asset classes etc in an enabler to achieve this.

Asset Resilience
We have partnered with ARUP to better understand Company 'Resilience Framework'. Seperately we are working with Defra and partner regulators on developing policy on resilience standards

What are Network Asset Risk Models (NARMs)

There are a range of ways in which the health of assets can be assessed and measured

One tool that **Ofgem use is a more quantitative NARMs model**.

A key requirement for this tool is **establishing consistencies** across a range of areas such as:

- Asset classes (e.g. a pump station includes motors, buildings, security etc)
- Definitions of minimum expected maintenance activities (do nothing)
- Types of interventions and impacts on asset health
- Faults vs failures vs alarms (to assess failure rates)

This was difficult, but more straight forward in the gas industry, due to previous centralisation under British Gas.

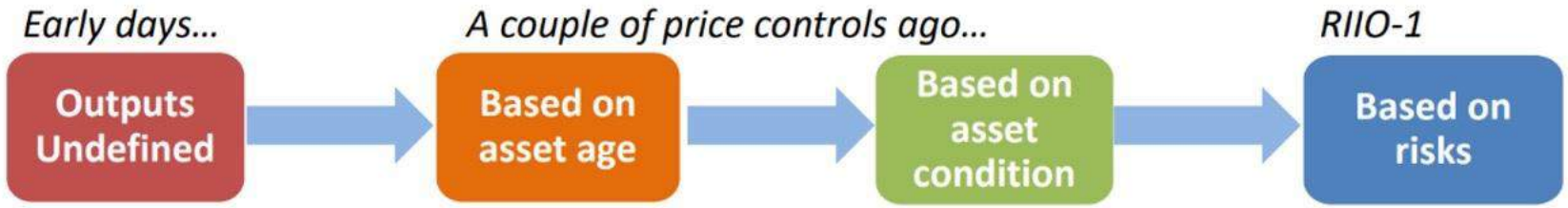
A key element of asset health models is not just the ability to assess current health but **forecast deterioration** rates over time under different scenarios.

The NARMs approach also relies on **standardising key data inputs**. Although the types of data vary by asset class there are some key inputs that drive deterioration curves:

- Age
- **Condition**
- Fault history
- Duty
- Asset characteristics (material, diameter, grade of steel etc)

How does NARMs work in the Gas sector

The gas industry began working on asset health models **around 2010** and it has taken **multiple AMPs** for the gas sector to get to its current position.



A key point to note is that the models are continually being refined to increase confidence in different aspects.

Although these models provide a good level of insight into asset health they are still **a decision support tool** – are high fault rates an indication of end of life or poor current maintenance e.g. not maintaining air valves on water mains?

As a result NARMs are **not used for all asset classes** in the gas industry. Approximately 70% of gas industry assets are represented in NARMs models.

Ofwat might therefore want to consider specific asset groups e.g. Infrastructure assets are most widely represented in the NARMs models

Benefits and Challenges of NARM in the Water Sector

NARM in the Water Sector – Benefits & Challenges

Early thoughts based on initial discussions. To be explored further should work progress to a full Pilot stage

Strengths of adopting NARM (or NARM-related) approach for assessing and planning based on long-term asset health	Better knowledge of asset condition, performance and service risks to **drive long-term decision making** (beyond 5-year cycles), how this varies between asset classes and companies and enabling tracking of long-term AH and forecast service improvements. This will move the company's focus from reactive to proactive investments.
	Improved understanding and visibility of the amount of **efficient expenditure needed to manage these future risks**, including the benefit of Enhancement work on Base expenditure.
	Development of a **common "risk language"** across different assets and intervention types will support cross-company comparability and better economic analysis of options to maintain/improve long-term AH and service levels (not always a direct correlation)
	Encourage the implementation of **value-based asset and investment management decision-making processes** and **line–of–sight across the organisation**. Provides evidence of asset management excellence & delivery against stated AM Policy.
	Justification of the **optimum level of long-term asset health** per company/asset and the best programme of investments to deliver (Capex/Opex) – based on sound engineering and economic analysis.
Potential weaknesses where assumed benefits may not be delivered, or a better alternative may exist	It is difficult for customers and stakeholders to understand the relationship between the cost to deliver a NARM target and the benefits to service they may receive, now and future. **Lack of transparency** may limit the effectiveness of NARM for convincing customers/stakeholders that companies are investing appropriately and efficiently
	Some water asset classes are not suitable for a NARM approach, or failure/risk models are too complex to implement consistently. Even for suitable asset classes, the time to collect data, complete analysis and build NARM monetised risk models may be prohibitive.
	Adoption of **an energy-sector type NARM incentive mechanism** may require a **disproportionate level of company effort, regulatory oversight and scrutiny**. Significant burden of proof for company investment decision-making and benefits delivery (plus any financial rewards/penalties) may drive counter-productive behaviours and decisions.

How does NARM link to wider Asset Management outcomes?

NARM & Asset Management

How can a NARM approach encourage & incentivise better asset management?

ICS

Organisation & People

Leadership & Governance

Successful delivery of NARM targets requires an **effective line of sight between planning and operational teams** ensuring that all decisions are made based on, or accounting for, **the impact on the agreed NARM target**. This requires **effective inter-team communication and governance processes**.

There are also implementation challenges given that NARM is:

- An abstract concept for non-specialists
- Forward looking (**future** as well as **current** risk)

Which can be difficult for typically reactive / short-term focused organisations.

There may also be external / customer drivers which do not necessarily deliver major long-term risk benefits (e.g. legal requirements; arising from missing service valuations / WTP data).

Strategy & Planning

Asset Management Decision Making

NARM is underpinned by an understanding of the **costs and benefits** arising from different options to manage asset risk and/or deliver customer outcomes. This is no different to a traditional economic analysis but encourages **better quantification of alternative investment benefits** and exploration of a wider range of options (CAPEX + OPEX) to achieve NARM targets at lowest cost and risk.

Purpose & Context

The foundation of NARM is a **Service Value Framework**, which details **what is important to customer and stakeholders** and **values alternative levels of service in monetary terms**. The SVF is the foundation of the long-term monetised risk NARM metric and **must be aligned to wider business goals and strategy** to ensure investment is targeted effectively and efficiently

Value & Outcomes

Review & Continuous Improvement

Companies will need to quantify the long-term benefit associated with **all assets** as part of:

- Strategic planning
- Tactical decision making

This will drive **strategic and delivery plan optimisation** (and effective mitigation strategies) to:

- Set realistic and achievable targets and meet stakeholder expectations
- Avoid late delivery and/or plan deviations

A continuous improvement cycle is essential to **minimise NARM under-performance risk** and **maximise the efficiency of target delivery**.

Risk Management

By understanding the value of each investment in long term monetised risk terms, companies will be able to better **prioritise assets and investments** and **develop appropriate levels of risk controls** to the investments that delivers highest value to customers.

Information Management

Quantifying long-term risk requires an improved understanding of **how the condition (and associated performance) of assets relates to current and future risk**. Better decision-making capability incentivises targeted investment in data, information and systems (and the processes to make best use of these).

Our work to date and next steps

In August 2025 we commissioned ICS to review the suitability of a NARMs approach to the water sector:

The report looked at:

- **What is NARMs** and how does it work from a modeling perspective
- The **application of NARMs** in the energy sector (cost assessment, funding adjustments, wider benefits)
- Opportunities to **apply the NARMs principles** to the water sector
- Considerations with respect to **integration with Ofwat's framework**
- **Alternative approaches to NARMs** in developing forward looking asset health metrics
- **Which asset classes may be better suited** to this type of approach based on sector wide data availability / maturity.

In addition, ICS have produced a separate report which outlines **what a pilot would look like** to develop NARMs / forward looking asset health models in the water sector.
We have used the second report as the basis for our procurement tender event which was issued 2nd March

Useful links

Subject Area	Link
Asset Management Licence Condition Blog post (Ofwat)	Asset management in water: what's changing and why it matters – Ofwat
PR24 Documents (Ofwat)	Final determinations – Ofwat
Asset health Re-opener	Enhancing Asset Health Understanding Workstream - Ofwat
NARMS (Ofwat Works)	251119-NARM-Background-Application-Part-1-Report-v2.0-Final-2.pdf
NARMS (OfGEM works)	NARM Handbook v4.0
Asset Management Maturity Assessment (AMMA - 2021)	Asset management maturity assessment (AMMA) - Ofwat
Operational Resilience discussion paper (2022)	Operational resilience discussion paper - Ofwat

Thank you / Q&A

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Thinking about Sufficiency

Nicholas Adjei
Deputy Chief Inspector
Drinking Water Inspectorate

What’s coming your way

- **NIC Recommendations**
- **IWC Recommendations**
- **Working together, our approach**
- **Research project and findings**
- **Sufficiency, definitions and key recommendations**
- **Risk based approach to sufficiency**

NIC Recommendations

Developing resilience standards in UK infrastructure, (NISTA) highlighted the need to identify and address gaps in the regulation of the water industry.

- ***Peak Demand***
  - Asset principles for sufficiency and resilience provide a minimum standard to risk assess against (Appendix 1 of report)
- ***Single source of supply/asset***
  - Define critical points and pathways and risk assess to understand impact from underperforming or loss of assets.
- ***Forward looking asset health standard***
  - Setting a singular standard without understanding criticality within the system is not recommended. A risk-based approach should identify the most critical assets and ensure they are robust.

IWC Recommendations

IWC also highlighted similar needs in recommendations 66, 67 and 68.

66 “Statutory resilience standards, covering system, infrastructure and supply chains, should be developed and adopted for the water industry in England and Wales”

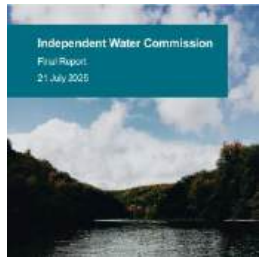
67 “The UK and Welsh Govern ments should strengthen the requirements on companies to map and assess the health of their assets, and the regulator should ensure metrics for asset health are sufficiently forward-looking.”

68 “The regulator’s oversight of infrastructure resilience and asset health should be strengthened, under its supervisory approach. This should include the appointment of a Chief Engineer on the board of the regulator in England and Wales respectively”

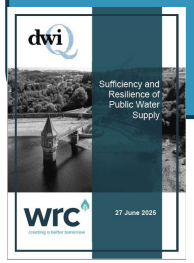
Our Approach

National Infrastructure & Service Transformation Authority

NISTA & IWC Recommendations

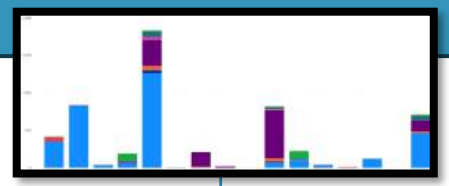


Independent Research Project



Defra Library Literature Review

Research from Company own Data



Work with Ofwat

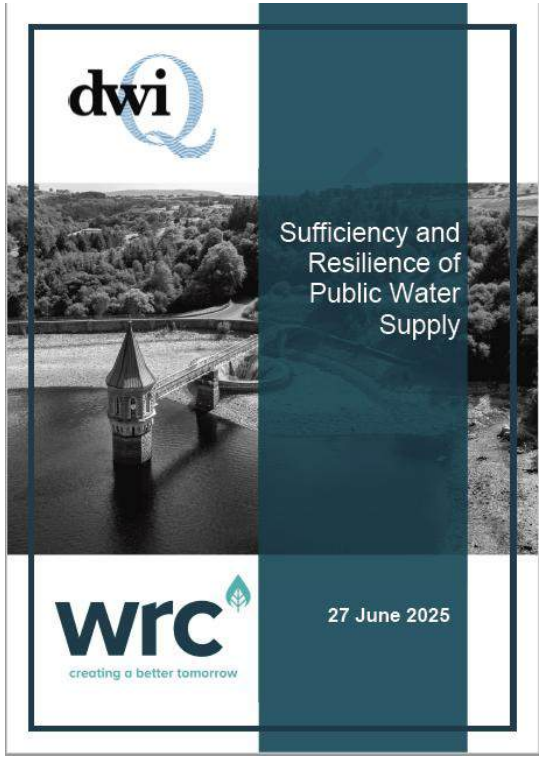
Ofwat

Sufficiency Guidance

dwi

Research Project

Primary Question: *What can the UK learn from how the resilience and sufficiency of water supply, from source to tap, is defined, measured and governed internationally?*



11.8 Concluding remarks

Without an agreed understanding of sufficiency, apart from the extreme minimum in the SEMD, there is a need for regulatory guidance on how one should comply with a sufficient wholesome water supply. We do not believe that all recommendations of WWRAG have been fully implemented. We also note disparity internationally regarding what is considered absolute minimum water supply (notably between the SEMD and WHO).

In addition, this review has shown that there is no single jurisdiction that provides a robust regulatory framework for ensuring customers receive a continuous and resilient supply. Sufficiency is not a defined term in the WIA. However, none of these are recommended alone as a template for implementation in England and Wales.

Research Project

The Research concluded that existing methods fell broadly into 6 categories as follows;

- **Asset Approach**
- **Technical Standards**
- **Assurance Approach**
- **Planning Approach (similar to DWSP*)**
- **Hazards Approach**
- **Levels of Service Approach**

*Drinking Water Safety Plan (DWSP)

Table 10.1 Expected return periods (1 in x years) of water use restrictions from current WRMPs (2024-2029)

Water company	Temporary use ban	Non-essential use ban	Rota cuts/ standpipes/ emergency drought orders	Notes
Portsmouth Water	1:10	1:40	1:100*	
Anglian Water	1:10	1:40	1:100*	
Severn Trent Water	3:100	3:100	Unacceptable	
Dwr Cymru Welsh Water	1:20	1:40	Never	
Southern Water	1:10*	1:20*	1:200*	*Believe it will more likely be 1:4
Yorkshire Water	1:25	N/A	1:500*	
Affinity Water	1:10	1:40	Unacceptable beyond shorts periods of time*	
SES Water	1:10	1:20	1:200*	
Thames Water	1:10	N/A	N/A	
United Utilities	1:40	1:80	1:200*	
South West Water	1:20	1:40	1:200*	
Northumbrian Water	1:150	1:200	1:200*	
Bristol Water	1:15	1:33	1:500*	
Cambridge Water	1:10	1:50	1:100*	

*The National Framework for Water Resources requires water companies to plan for 1:500 drought resilience by 2040. (Environment Agency, 2020)

DWI Sufficiency Report & Recommendations

Using the approach to DWSP concepts and introducing the idea of ***Asset Principles rather than standards*** to help assess where there was a "risk" to sufficiency, these included items such as power resilience and headroom. These Principles were taken from our research.

DWI uses ***'sufficiency' as practical indicator and outcome*** of resilience and asset health.

We build great assets.....

High quality and quality of water

Definition of sufficient supply

- The Inspectorate defines a ***sufficient supply*** as, '*continuous delivery of water in adequate quantity and pressure to meet all domestic purposes*.**'**
- A '***continuous***' supply must be uninterrupted, unless the outage is planned and appropriately notified to the consumer for the purposes of carrying out necessary works as defined by section 60(1) WIA.
- ***'Adequate quantity and pressure,'*** are defined as a minimum flow of 10 litres per minute (L/min) at a pressure of at least 10 meters head (10mH, or 1 bar) at the boundary stop tap to the property. For clarity, the provision of a 'non-piped' supply such as bottled alternative water supplies (AWS) is unlikely to meet the definition of a sufficient water supply

Early Thoughts on Risk Assessment Methodology

- A systems approach should be used, sufficiency across supply systems and their component pats must be understood.
- Water Sufficiency and Resilience Planning (WSRP) operates the same way as Drinking Water Safety Planning (DWSP) – risk based
- Risk assessment for hazardous events impacting sufficiency is carried out using queries and scenarios (we are in a testing phase of this)
- The assessments for sufficiency risk include the methodologies developed for asset health in that the condition of an asset contributes to an overall assessment of risk at a supply system stage e.g. Treatment stage assets where the treated water storage condition grade is assessed is added to the conditions of other sufficiency dependencies at the treatment works such as raw water variability, chemical dosing conditions, flow configurations and redundancies.
- DWI categories used for DWSPs can be used for similar categorisations, scoring will be based on 'reasonable worst-case scenario' in use through SEMD/EPG requirement.

Relationship of the guidance with work by other stakeholders

- OFWAT working groups on asset health standards, boreholes, service reservoirs and Rapid Gravity Filters (on the supply side) plus wastewater assets. Developing asset resilience metrics and standards. These new and emerging developments will help with our proposed approach and integrate into overall outcome of sufficiency.

- Defra - Water Reform Bill, changes to definition of 'domestic purposes' to allow non-drinking water for toilet flushing and garden use – this will form part of overall renewed picture for sufficient supplies for all domestic purposes?

Panel discussion 1 and Q&A

- Jim Hall, ICE
- Helen Edmundson, Defra
- Matt Hateley, Ofwat
- Nicholas Adjei, DWI

Coffee break

Insight overview: estimating sustainable asset replacement expenditure in the water industry

Aastha Mantri

Economic Insight

WICS' APPROACH TO ESTIMATING SUSTAINABLE ASSET INVESTMENT

Presentation at the Institution of Civil Engineers

Economic Insight

4th March 2026

THE WICS APPROACH

1

WICS found that its current top-down approach was not encouraging sufficient investment in asset replacement

Existing approach not sufficiently focused on maintaining long-term assets

Aiming to 'pay the minimum' required inconsistent with protecting consumers

Short-term regulatory cycles inconsistent with the time horizon of investment

Evidence indicated current levels of expenditure were insufficient

Implied asset lives far exceeded expectations: 1,014 v 200 years for wastewater infrastructure

Preliminary estimates of replacement requirements far exceeded actual spending, even under very conservative assumptions

WICS followed a collaborative approach, working closely with Scottish Water and Professor Adey to develop the method and collect the data

Based on Scottish Water's best understanding of assets

WICS recognised further progress would need to be made, but this represented a good starting point

Transparent and collaborative approach

WICS adopted Ethical Based Regulation and worked closely with Scottish Water, under the oversight of Professor Dr. Bryan Adey

Data collected in stages with consideration of quality

1. Allocated assets into categories
2. Estimated broad range of replacement costs and lives
3. Assigned confidence grades
4. Narrowed into final range

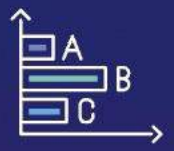
We worked with the companies to develop an understanding of their asset stock, lives and replacement costs, at the level of granularity used by WICS

1. **Understood data available**
2. **Issued data request**
3. **Supported data collection**
4. **Reviewed data provided**

How does our approach compare to Scottish Water?

Both rely on companies' estimates used internally to plan replacement

Average asset lives are comparable



Robustness checks based on range across companies not internal range

Additional adjustment made for comparability with FD allowances

OUR FINDINGS

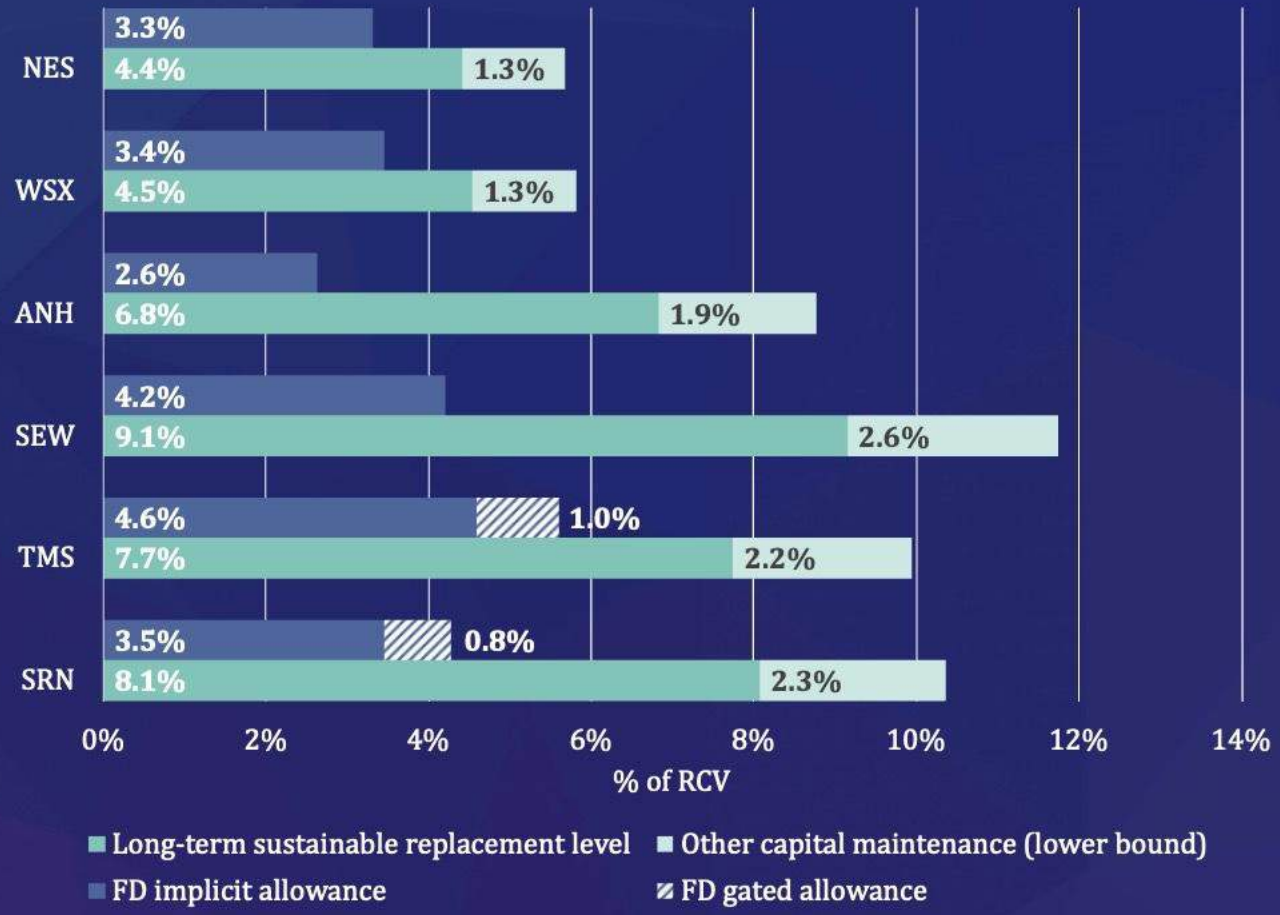
2

There is a material gap between our bottom-up estimates of the long-term sustainable level of asset replacement expenditure and current allowances

Materially greater than allowances:
91% greater than FD implicit allowances on average (range of 31–159%)

Comparable to Scottish Water results:
106–156% greater than previous price control allowance

Larger gap including non-replacement:
145% greater than FD implicit allowances on average (range of 69–233%)



DESIGNING THE NEW REGULATORY APPROACH

3

A common vision of the long-term sustainable level of infrastructure investment might need to rely on a combination of approaches

Identifying an efficient level of asset investment is inherently challenging

Various approaches with their own strengths and weaknesses exist but none are perfect


Econometric benchmarking


Top-down indicators


Bottom-up approaches

A common vision for a long-term sustainable level of infrastructure investment

The WICS approach could provide useful information to support sustainable asset investment as part of the future regulatory model

Bottom-up approaches are inherently more data-intensive

Requires detailed information on each companies' asset stocks, asset lives, and replacement costs aligned between the companies

Industry currently has varying data quality by asset class

Lower confidence in installed date and condition for some asset classes

Straightforward to understand and implement

It cuts through a lot of complexity and, therefore, might be better understood by stakeholders

Minimises need for subjective assessment by companies

E.g. Facilitates replacement of assets in line with their reasonable asset lives

Key improvements to the WICS approach to facilitate its adoption within the new regulatory model

Scope of investment

- Capture large non-replacement costs
- Consider optimality of historical spend on infinite-life assets
- Replacement of 'infinite-life' assets

Future proofing

- Growth of asset base
- Future replacement costs

Alignment

- Standardised approach to estimating replacement costs and asset lives
- Alignment on asset class definitions between companies

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Resilience standards for asset health

Nicholas Francis (Reckon) and Matt Humphrey (Anglian Water)

4 March 2026

Recap of key concerns identified with Ofwat's regulatory approach to asset health up to PR24

Informational concern

Behavioural concern

Funding concern

Responsibilities concern

The informational concern from Reckon (2024)

> “**Informational concern**: there is not enough useful information available about the risks of service disruption and adverse environmental outcomes in the future that may arise from asset deterioration or poor asset health, and how these risk are being managed by water companies.”

The risks covered here should also include risks of higher costs to customers over the longer term

Water White Paper - measures to tackle the informational concern

"will work with the new regulator to **develop a fuller picture of asset health**, building on Ofwat's plans for a data-gathering exercise to provide a snapshot of asset conditions"

"We will also work with the new regulator **to develop forward-looking asset health metrics** to ensure this critical infrastructure gets the funding it needs."

"As we build this clearer picture of the asset base, we will develop **statutory resilience standards** to ensure all companies make forward-looking long-term assessments of their systems"

Contribution from statutory resilience standards for asset health to improving outcomes over the longer term

1

Involves a more proactive role for water companies, the regulator and the Government in **forward-looking risk management** for asset health

2

Supports an iterative approach to regulatory cost assessment to achieve a **sensible balance between near-term bill impacts and control of longer-term risks**

3

Provides **clearer expectations** on water company actions to manage asset health risks over the long term and on the evolution of industry performance over time

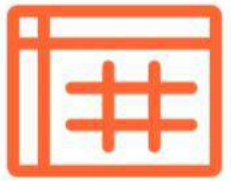
4

Builds knowledge and capabilities around the relationships between asset health investment and longer-term outcomes for customers and the environment

In very broad terms, what might resilience standards for asset health involve?

Requirements for companies to carry out forward-looking **risk assessment** and - and take actions to control risk- in accordance with defined rules and processes

One or more **metrics** against which quantitative standards can be set, with the standards against these metrics reflecting planned risk tolerance



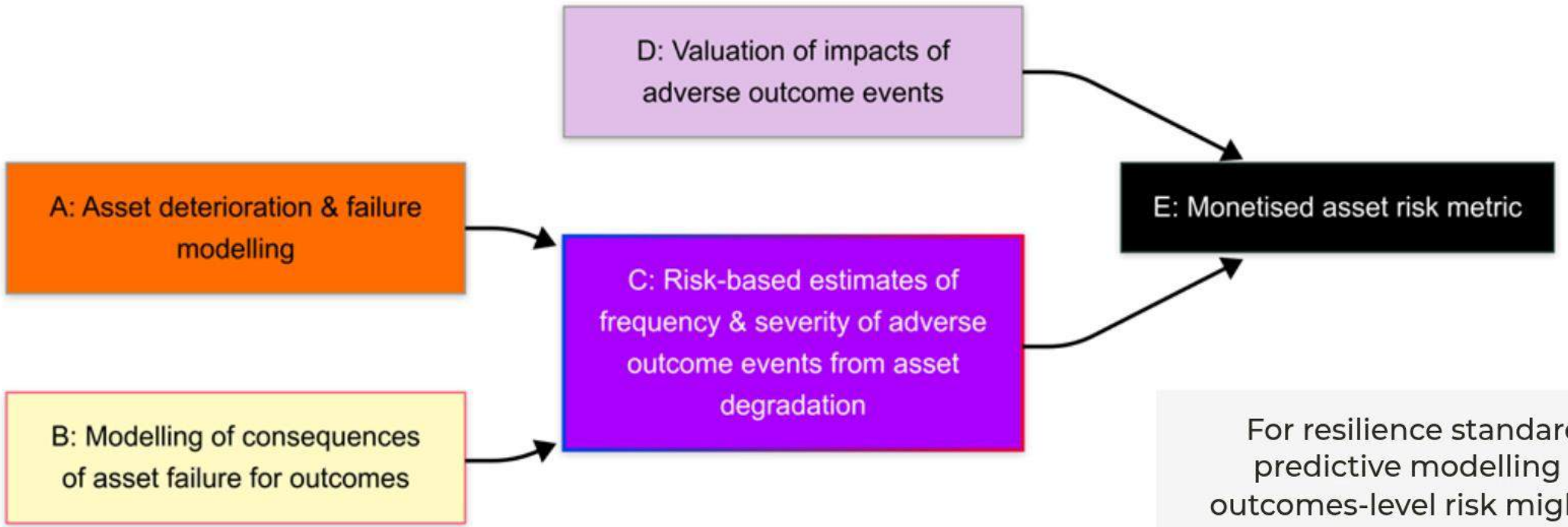
Predictive modelling of how a company will perform against quantitative standards / other metrics over a future time horizon under well-defined scenarios

Drawing on these elements, the regulatory framework needs to **integrate risk analysis and cost assessment** to enable iteration towards a coherent position on the costs to customers and extent of risk mitigation

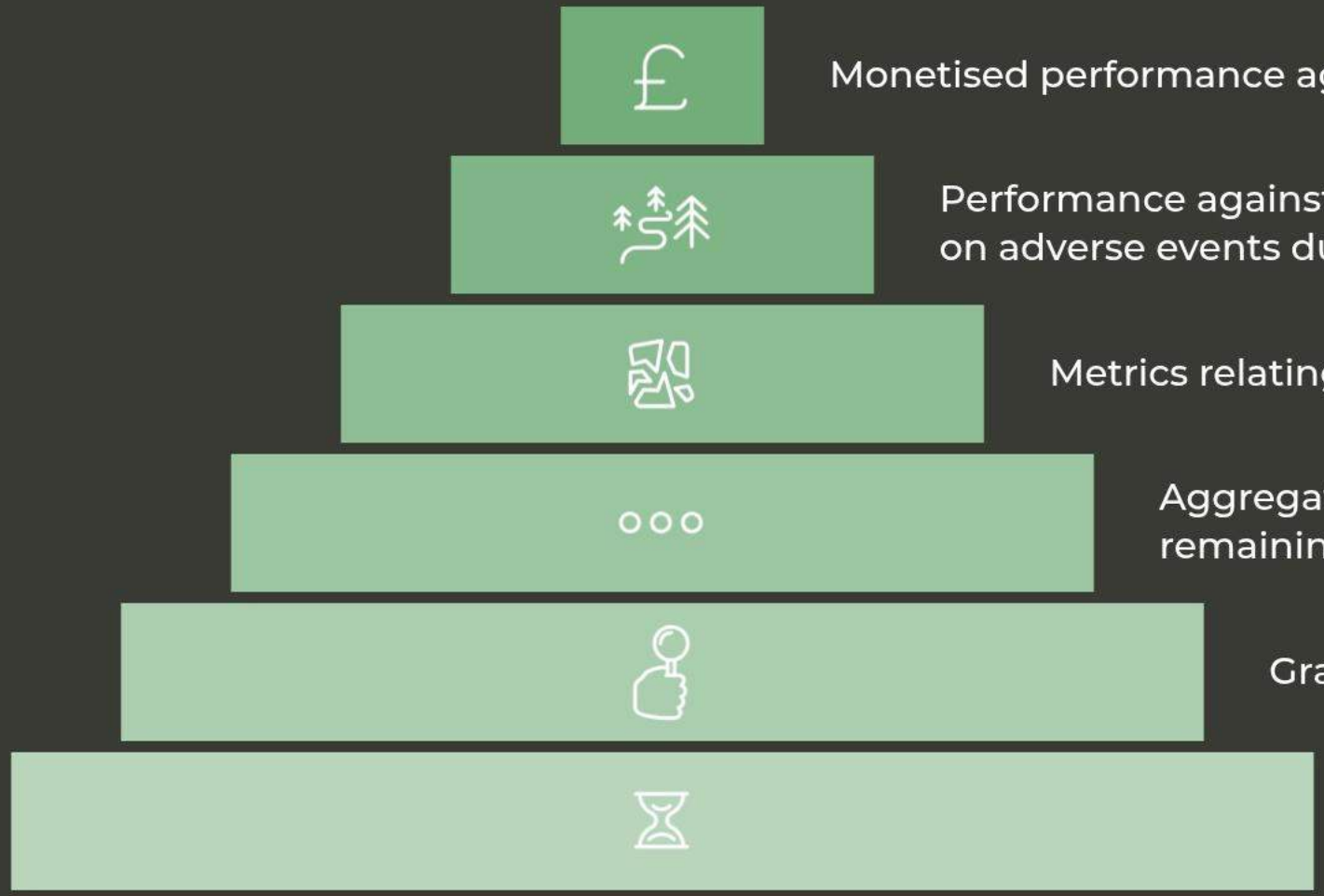
“The Commission believes that there is benefit in specifying outcome-based resilience standards at the system level, rather than prescriptive requirements for individual assets.”

Independent Water Commission final report page 378

Predictive modelling of risk can draw on Ofgem's development of NARMs, although it will take time for the capabilities to be developed



For resilience standards, predictive modelling of outcomes-level risk might be more useful than modelling of monetised risk metrics



Monetised performance aggregated across all outcomes

Performance against individual outcomes (potentially focused on adverse events due to asset health shortfalls)

Metrics relating to asset failure rates / asset failure risk

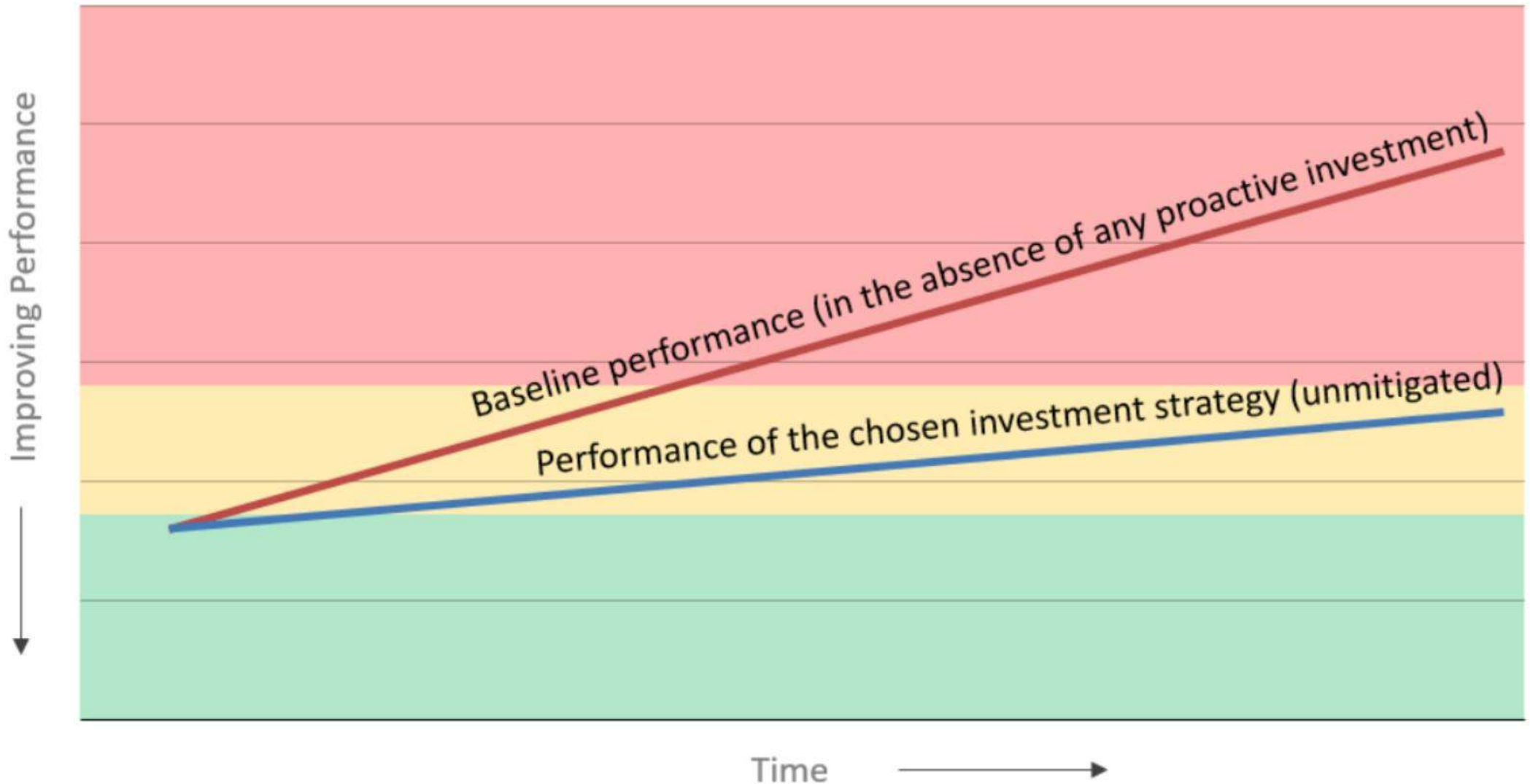
Aggregated metrics of asset condition, age or remaining life

Granular assessments of asset condition

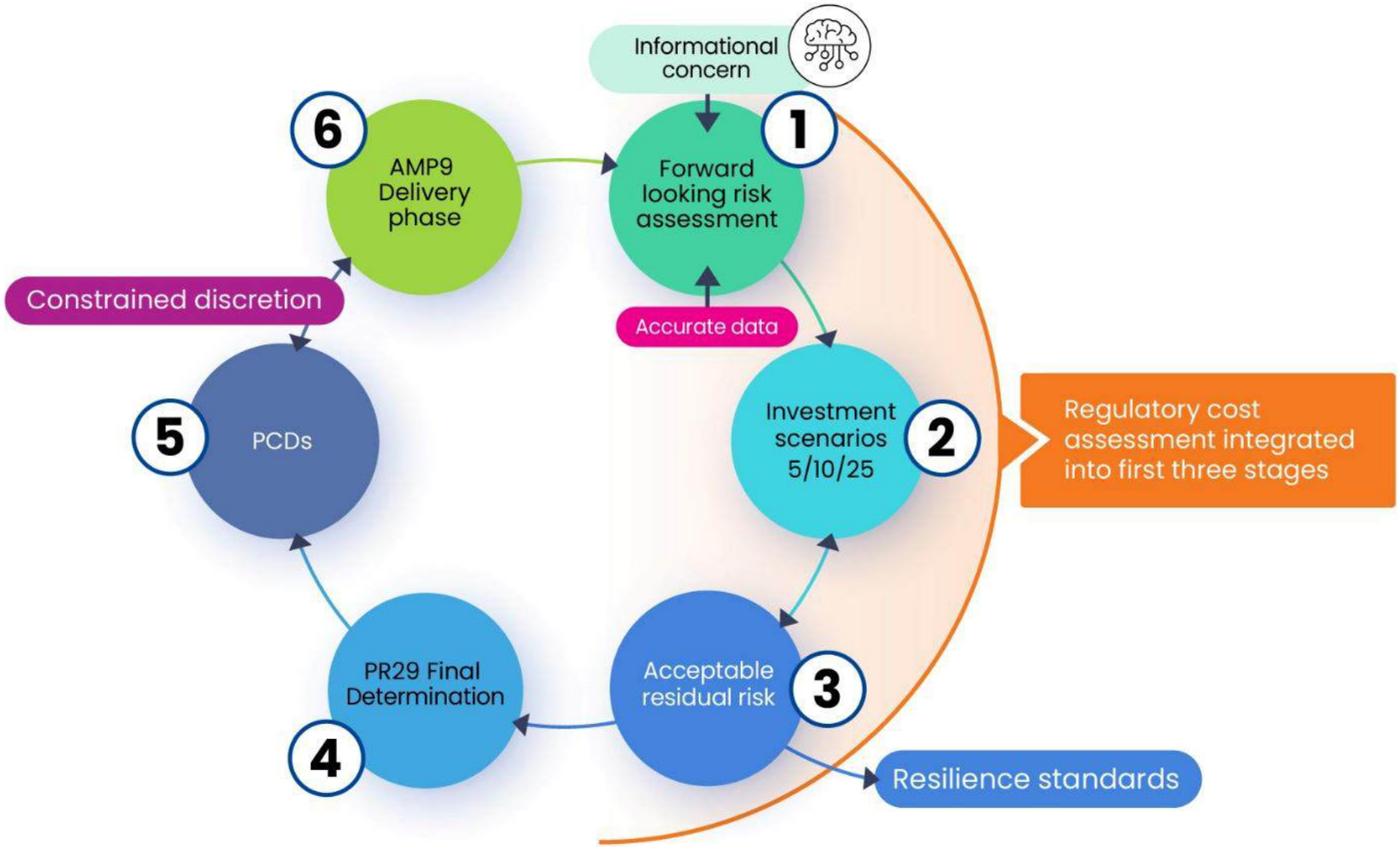
Granular metrics of asset age or remaining life

Role for a range of metrics - for reporting outturn data on over time and, where practical, for predictive modelling: these can provide evidence **to inform broader outcomes-based risk assessments**

Risk assessment and investment scenarios



Risk assessment and the PR29 regulatory cycle



Longer term ....

- Over the longer term, we see a key role for predictive modelling of future outcomes risk
- While challenging, this modelling is directed squarely at the matter of *quantifying the benefits of proactive capital maintenance*
- For resilience standards, outcomes-level risk metrics may be more suitable than £m risk metrics (e.g. NARMS) - but can draw on the same underlying modelling and data
- Ofwat's recent work on NARMs is welcome and it is important that the pilot exercise proceeds
- This work is unlikely to be sufficiently-well developed at PR29

Nearer term.....

- Develop metrics that are feasible for use at PR29
- Crucial role for rules and processes around water companies' risk assessment and on documentation of risk management
- Can specify the predictive modelling and metrics to be used to support that assessment
- Price control expenditure allowances will need to be aligned with any quantitative standards and with agreed level of risk mitigation
- Likely to need to tie funding for (proactive) capital maintenance to PCDs, ideally in a way that supports risk-based prioritisation over time

Panel discussion 2 and Q&A

- Aastha Mantri, Economic Insight
- Matt Humphrey, Anglian Water
- Nic Francis, Reckon
- Jo Harrison, United Utilities
- Andrew Beaver, Northumbrian Water

Summary and close

Bridget Rosewell

Thank you for attending