Asset Health Cost Change 2026

Asset Health Business Case: Upgrading Boreholes

UUW26-14

April 2026

United Utilities

Water for the North West

Executive Summary

United Utilities Water (UUW) welcomes Ofwat's consideration of evidence-based proposals for additional asset health investment, focused on priority assets identified through the sector-wide *Roadmap for Enhancing Asset Health Understanding in the Water Sector*.

This business case, which is a standard – single main submission, sets out a targeted programme of additional investment at **24 borehole assets**, with the primary objective of **improving resource yield and securing long-term reliability at 17 critical sites**, at a total expenditure of **£13.3m** (net of repair savings). The proposed investment addresses material and accelerating asset health risks that can no longer be managed efficiently through AMP8 base expenditure alone.

Description

Boreholes are a critical component of UUW's water supply system, providing access to groundwater resources through deep vertical or horizontal shafts drilled into aquifers. Pumps abstract groundwater for treatment and distribution, while borehole headworks form the essential interface between underground infrastructure and the surface network. These headworks perform a vital role in protecting aquifers from contamination, safeguarding water quality, and ensuring the safe and reliable operation of the abstraction system.

The proposed investment focuses on assets where evidence demonstrates that deterioration is reaching a level at which continued reliance on reactive or short-term interventions is no longer cost-effective or resilient. The need for additional allowances has been identified through UUW's established asset and operational risk management processes, including Drinking Water Safety Plans, and reflects an improved understanding of asset condition informed by recent site surveys and inspections.

This proposal is aligned with UUW's Borehole Asset Class Strategy but is distinct from our AMP8 base investment plan. It targets refurbishment and renewal at defined priority assets to improve yield and reliability where base expenditure is insufficient to meet long-term resilience, reliability and water quality requirements.

Asset Class Strategy alignment:

The proposed programme supports the Borehole Asset Class Strategy vision to:

- Deliver a **reliable and resilient groundwater supply**, ensuring borehole sources are deployable when required and [✂], in support of future demand in line with the Water Resource Management Plan (WRMP).
- Achieve a **step change in borehole asset health**, building on previous investment to protect groundwater sources and optimise long-term, resilient supplies.
- Apply a **data-driven, risk-based approach** to asset management, balancing short-term operational needs with long-term asset health risks arising from climate change and population growth, while always prioritising water quality.
- Meet regulatory commitments for **environmentally sustainable abstraction**, including under the Water Framework Directive and the Environmental Destination Framework.

The overall strategic direction is summarised in Section 3.4.15 and set out in detail within the Asset Class Strategy.

Need

UUW operates **149 boreholes across the North West of England**, together contributing approximately **8% of regional water supply**, this can rise by **an additional 50% during periods of water stress** (as demonstrated during the 2025 drought). While groundwater represents a smaller proportion of total supply under normal conditions, boreholes can be [✂]and are critical to maintaining a drought-resilient service.

Many of these assets were constructed in the early twentieth century and have operated continuously since, supported primarily through routine maintenance. Boreholes can be categorised into three broad groups:

- [✄]with limited network connectivity;
- Boreholes supporting local demand and contributing flexibly to the regional system; and,
- Boreholes used intermittently to meet peak demand or offset surface water abstraction during dry periods.

As these assets continue to age beyond their original design life, the relationship between asset condition and operational risk has become increasingly non-linear. The investment addresses critical borehole asset health risks identified through recent structural surveys. Without proactive intervention, there is a growing risk to security of supply, water quality and safe operation, directly resulting from deteriorating asset health. These risks are consistent with the asset health and resilience challenges identified through PR24 and reflect the increasing consequences of operating borehole assets beyond their intended lifespan.

What Base Buys

UUW's AMP8 base programme is prioritised to maintain compliance and manage immediate operational and safety risks across borehole sites. Evidence shows that base expenditure remains effective in addressing short-term compliance and safety requirements. However, funding is increasingly directed towards **temporary interventions** that sustain operability rather than restoring underlying asset health.

Continued deferral of proactive intervention increases the risk of accelerated deterioration of critical civil and structural elements, raising both the likelihood and consequence of asset failure and resulting in higher long-term costs for customers. Base expenditure alone is insufficient to address the structural risks at the most critical sites.

Proposed Programme and Interventions

The proposed additional allowance will deliver a defined, targeted programme across **24 priority boreholes**, addressing the highest structural asset health risks through three principal intervention types:

1. **Modernisation of borehole headworks (£5.2m)**
   Reducing the risk of ingress, improving operational efficiency, and strengthening protection of aquifers.
2. **Borehole cleaning (£0.6m)**
   Restoring yield and extending asset life to achieve optimal serviceability.
3. **Borehole renewal through relining or redrilling (£7.7m)**
   Replacing assets beyond efficient maintenance to restore full abstraction capability.

Benefits

The primary objective of the programme is to secure a resilient supply of high-quality water at 24 of UUW's [✄]by 2030. The interventions will **safeguard peak demand capacity** and **protect water quality**.

Through the Water Resource Management Plan, UUW has demonstrated that maximising production from existing assets often represents the most cost-effective and efficient means of maintaining security of supply in the face of population growth and climate change.

Additional benefits include the designing-out of health and safety risks, particularly those associated with confined space working at subterranean assets, supporting safer and more efficient future operation and maintenance.

Cost efficiency and best options for customers

Efficiency is embedded through disciplined scope control, external benchmarking of our estimates against third party costs, targeted intervention selection, and use of established AMP8 delivery models consistent with UUW's PR24 approach and asset strategy. Customer protection is provided through output-based Price Control Deliverables (PCDs), ensuring customers only fund efficiently delivered outcomes.

Overall, this business case represents a **proportionate, evidence-led and low-regret response** to material and escalating asset health risks. It aligns with Ofwat's outcome-focused framework and reflects customer preferences for proactive investment that protects environmental performance, service reliability and long-term value for money, supporting resilient water services for customers, communities and the wider North West.

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1. Description

This section sets out a defined, deliverable programme of asset-health investment for 24 boreholes across 17 sites, targeting critical groundwater sources where deterioration is now beyond efficient management through base allowances alone. The programme includes 18 headworks renewals, 5 structural cleans, and 4 borehole renewals. These interventions address structural degradation, raw-water quality risk and yield decline across a mature and strategically important asset class that supports both local supplies and regional system resilience.

1.1 What the investment will involve

1.1.1 Our proposed investment case, which is a standard – single main submission, addresses critical borehole asset health risks identified through recent structural surveys. This investment is in addition to, and distinct from, the AMP8 programme of routine borehole maintenance.

1.1.2 UUW’s boreholes can be broadly categorised into three groups, reflecting differing levels of operational criticality:

- [✂], with limited regional connectivity;
- Boreholes that **support local demand** under normal operation and can also contribute to the regional supply system; and,
- Boreholes that are used **intermittently** to meet peak demand or offset reduced surface water availability during dry summer periods.

1.1.3 Irrespective of their intended use or supply arrangements, all borehole assets have a consistent set of core requirements:

- They must be **structurally sound** to [✂];
- They must be **reliably available**, including after extended periods out of service; and,
- They must be capable of **efficiently meeting their design abstraction capacity**, yield and licensed volumes.

1.1.4 Informed by these core requirements and the outcomes of our recent investigations, the proposed investment focuses on three broad types of intervention.

Modernisation of borehole headworks

1.1.5 This involves raising subterranean headworks structures above ground, enclosing them within a secure kiosk, and upgrading associated instrumentation. These interventions reduce the risk of ingress and contamination, improve operational efficiency through enhanced monitoring, and reduce health and safety risks associated with confined space access. **We propose to deliver 18 headworks renewals within this business case.**

Borehole cleaning to achieve optimal serviceability

1.1.6 This intervention involves specialist structural cleaning to extend asset life, improve pump efficiency and restore yield, thereby avoiding or deferring the need for redrilling. Cleaning may include mechanical scrubbing using heavy-duty nylon or steel brushes, high-pressure jetting, airlift systems to remove sediment infill, or chemical cleaning techniques.

1.1.7 In all cases, boreholes must be taken temporarily out of service, requiring coordinated production outage planning that considers wider system operability. Pumps and associated equipment are removed and assets are safely recommissioned following cleaning. These interventions reduce the risk of elevated turbidity and associated automatic shutdowns, helping to protect customers’ supply. **We propose to clean five additional boreholes as part of this business case.**

Renewing boreholes (relining or redrilling)

1.1.8 This typically involves relining to restore the integrity of the upper borehole casing, or complete redrilling of the borehole, including pump replacement and new headworks. These interventions enable more effective use of existing abstraction licences, reduce the risk of water supply service failure, and protect raw water quality. **We propose to reline or redrill four boreholes as part of this business case.**

1.2 Where we are planning to invest

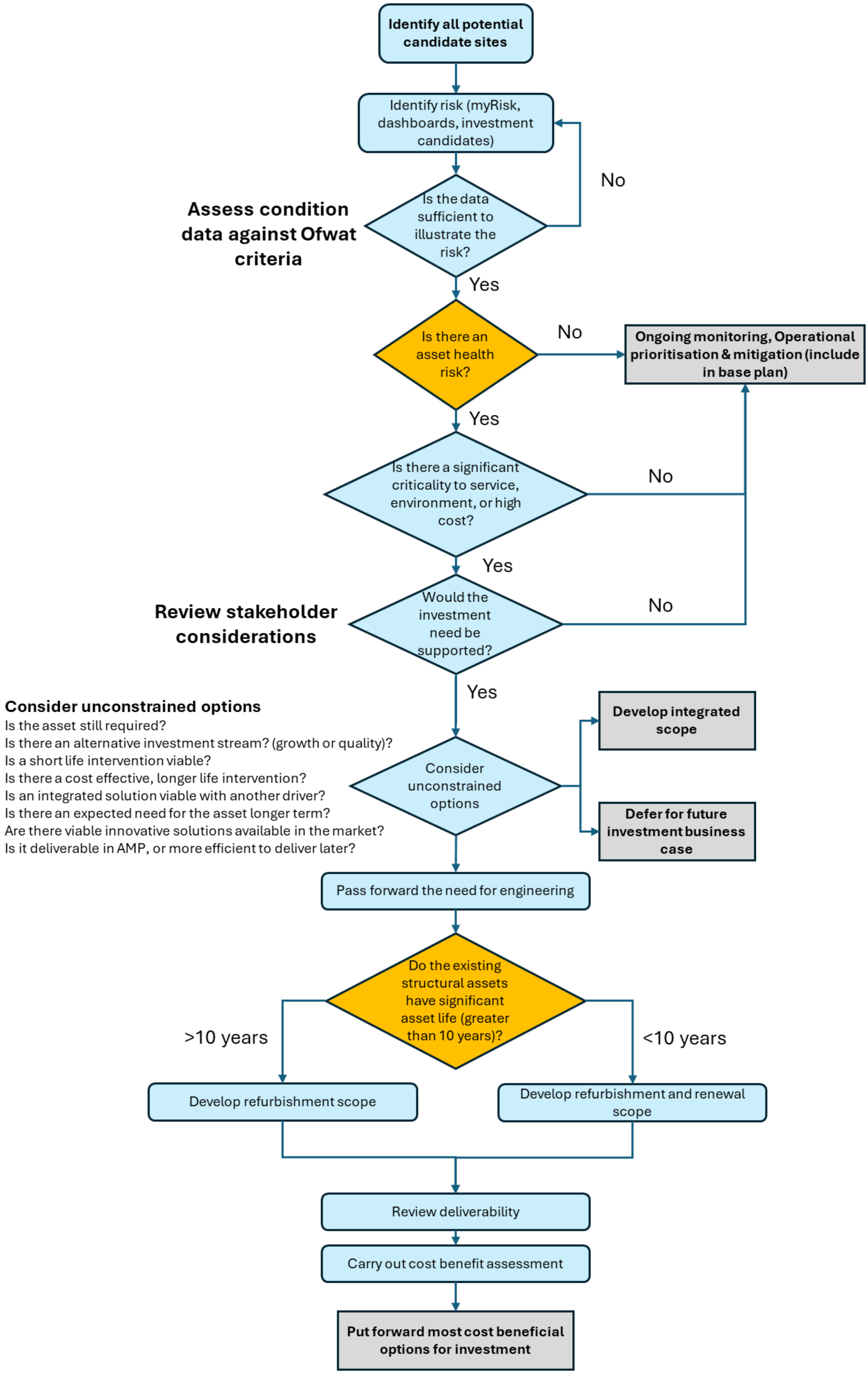
Site selection process

1.2.1 All 149 UUW boreholes have been visually inspected, with a large proportion also examined using CCTV and geophysical surveys to assess condition and identify investment needs. Using corporate asset management systems, we applied a structured set of criteria based on condition assessments and operational knowledge to identify assets with both the greatest asset health risk and highest potential customer benefit.

1.2.2 This process produced a prioritised list of sites most likely to exhibit material and escalating asset health risks. A deliverability assessment was then undertaken to define a programme that addresses these priority risks and can be delivered by 31 March 2030.

1.2.3 A schematic of the site selection process is included in Figure 1, with detailed outcomes included in Appendix A.

Figure 1: Asset health optioneering process



Source: UUW analysis

Candidate sites

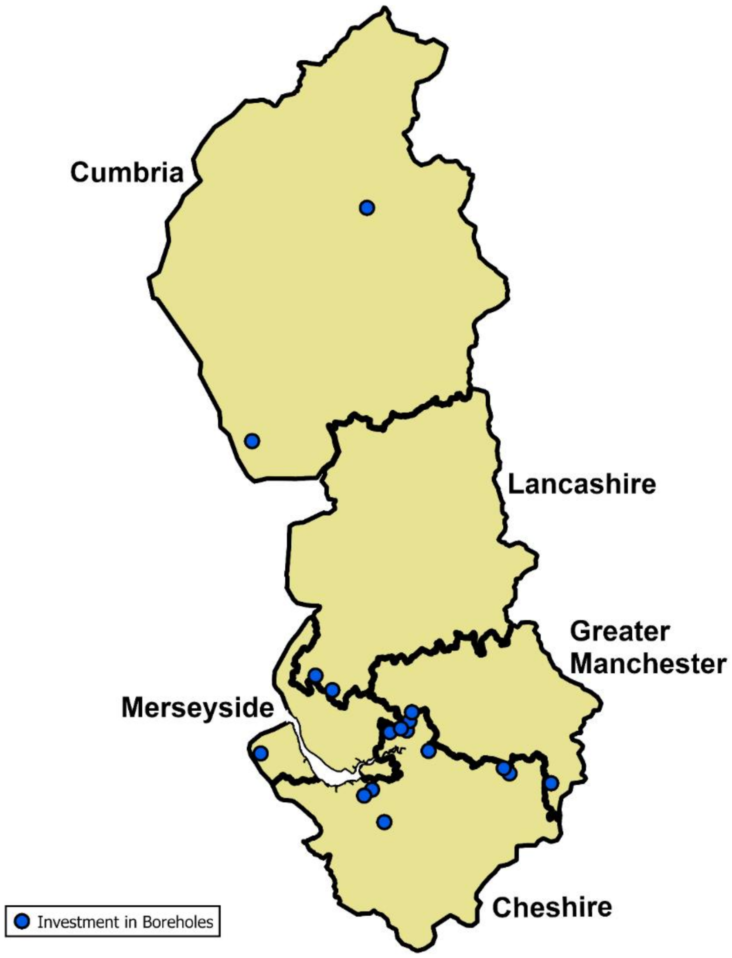
1.2.4 The feasibility assessment identified **24 candidate boreholes across 17 sites** where there is clear evidence of deterioration and material risk. The individual sites and proposed interventions are detailed in Appendix B Table 22.

1.2.5 The proposed programme will:

- Replace the headworks at **18 of the 24 boreholes** with new structures to current standards;
- Clean **five boreholes**; and,
- Renew **four boreholes** through relining or redrilling.

1.2.6 The programme targets interventions in a proportionate and efficient manner, focusing on those assets where additional investment delivers the greatest reduction in risk and most value for customers. Most of the programme is in the south of the region aligned to major aquifer locations in the North West as shown in Figure 2.

Figure 2: Map of proposed borehole programme



Source: UUW analysis

2. Guide to evidence

Table 1 below highlights where the key evidential components of our case are located within this document. It is designed to help readers easily navigate to the supporting information that underpins our assessment and justification and provide clarity on which key evidential requirements our document is focused on.

2.1 Asset health document signposting

Table 1: Signposting to key sections of document

Assessment area	Key requirements	Section reference
Need for step change in investment	Historical investment and asset management approach	3.5 and 3.6
	'What base buys' assessment	4
	Asset health risk to service environment	3.1
	Future asset health and risk	3.2
	Aligned long-term strategies	3.5
	Stakeholder engagement	5.5
Best option for customers	Unconstrained credible options	5.2
	Our proposed solutions	5.3
	Benefits versus the current position	5.4
	Customer engagement on options	5.5
Robust and efficient costs	Costing methodology for option and solution costs	6.1
	Efficient option and solution costs and good industry practice	6.1
	Cost benchmarking	6.2
	Solution costs	6.1
Customer protection	PR24 base expenditure plan	3.5 and 0
	Investment proposed in this cost-change	0
Investment delivery plans	Design and delivery risks log	8.2
	Aligned long-term asset strategies	3.5
	Stakeholder and supply chain engagement in delivery plan	8.1 and 8.5
	AMP8 investment delivery is on track	8.4
	Outline delivery schedule	8.3

3. Need for a step change in investment

This section covers the urgency of the investment need. It provides evidence of the risks created by deteriorating borehole health, it explains how those risks are changing over time, and why continuing with reactive, fix-on-failure approaches is neither viable nor sustainable and not in the best interest of customers.

UUW operates 149 boreholes, typically supplying around 8% of regional water production and providing high value during dry weather and in discrete supply areas. CCTV and geophysical surveys indicate widespread deterioration, including casing corrosion, slot blockage, sediment infill, and headworks integrity issues. Evidence shows that without proactive intervention, the fleet will experience increasing risks to security of supply, contamination, health and safety accessibility risk and reduced operational maintainability.

Baseline forecasting shows that 45% of boreholes are already operating beyond design life, and the majority will be life-expired within 30 years without a step-up in investment.

3.1 Risks mitigated by the investment

3.1.1 The proposed additional investment is required to mitigate material and increasing risks to security of supply, water quality and safe operation, arising directly from the continued operation of ageing borehole assets beyond their intended civil design life. These risks align with the asset health and resilience challenges identified in UUW's PR24 submission[1] and have been identified and escalated through established asset and operational risk management processes.

3.1.2 While AMP8 base expenditure remains effective at managing immediate compliance and safety risks, it is increasingly reliant on reactive, short-term interventions that maintain operability but do not restore underlying asset health. Further deferral of proactive intervention will increase the likelihood and consequence of failure, reduce system resilience and result in higher long-term costs for customers. The proposed additional investment provides a proportionate and efficient response to these escalating risks.

Security of supply / headroom risk

3.1.3 On an average day, boreholes provide approximately 8% of overall system production, but during periods of water stress their contribution can increase by up to 50%, making them critical to maintaining supply headroom.

3.1.4 As borehole condition deteriorates, there is a gradual reduction in yield and operational efficiency. Degradation can also lead to elevated raw water turbidity, increasing the likelihood of automatic shutdowns. Although treatment, automatic shutdowns and start-up-to-waste systems are in place and are effective in avoiding short-term customer impact, these controls increase the risk of unplanned outages, reducing available headroom and system flexibility.

3.1.5 Additional investment is therefore required to reduce the frequency of turbidity events, lower the risk of unplanned shutdowns and restore yield closer to permitted abstraction limits. Borehole cleaning and renewal are key interventions to deliver these benefits.

3.1.6 Significant population growth is forecast across the North West. In addition, UUW plans to support cross-regional raw water transfers to more drought-prone regions, including Severn Trent and Thames Water. Together, these factors will increase future demand and reliance on groundwater sources.

3.1.7 Water resource optioneering within the Water Resource Management Plan demonstrates that the most cost-effective means of maintaining security of supply is to maximise yield from existing assets. Without proactive intervention, deteriorating borehole condition will increasingly constrain supply headroom at precisely the point when operational reliance on these assets is expected to increase.

[1] UUW07 Chapter 7 Resilience and asset health

Water quality compliance risk

3.1.8 Deterioration of borehole linings can cause increased raw water turbidity, placing greater pressure on downstream treatment and raising compliance risk at water treatment works. While enhanced treatment can mitigate this risk, addressing deterioration at source through borehole cleaning and conditioning is a more efficient and resilient solution.

3.1.9 There is also a risk of groundwater contamination from surface water where deterioration affects borehole upper casings or headworks integrity. Loss of structural integrity can create shorter and faster contamination pathways to the borehole. Mitigation of this risk is a key benefit of headworks replacement and borehole lining renewal.

Health and Safety risk

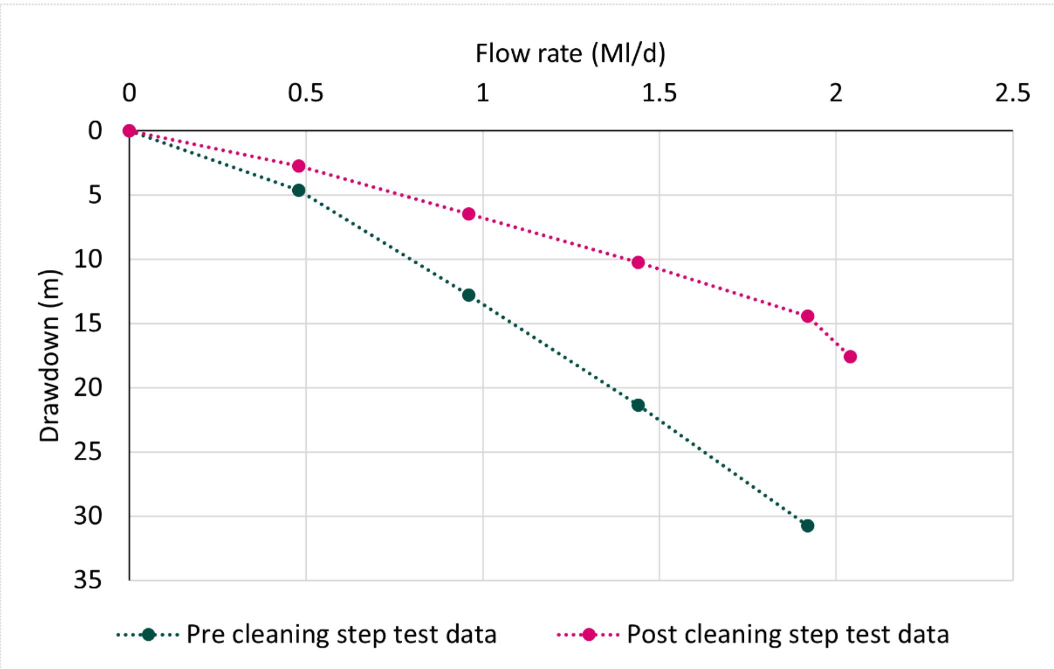
3.1.10 Many existing borehole headworks are located within subterranean confined spaces, presenting inherent additional health and safety risks to operational staff and increasing the complexity of inspection and maintenance activities. Raising headworks above ground materially reduces confined-space entry, improving safety outcomes and supporting more efficient and reliable operation.

Case study – [✂]

3.1.11 A CCTV survey identified that the slots in the borehole liner were blocked below the water level, biofouling was present and there was approximately 15m infilling of soft sediment at the base of the borehole. Between May 2019 and May 2021, there was a gradual decline in output from 3Ml/d to 2.1Ml/d (30%).

3.1.12 The borehole was cleaned via mechanical scrubbing and the infill was removed. Step test data is used to evaluate the well performance, where the well is pumped at a series of successively higher, constant rates. It measures how water levels (drawdown) respond to changing rates. The results of the pre- and post-remediation tests are presented in Figure 3 and show a clear improvement in specific capacity, a measure of how efficiently the well can abstract water. Prior to remediation, pumping at a rate of 80 m^3/h (1.92 Ml/d) resulted in a specific capacity of 2.60 m^3/h per metre of drawdown. Following remediation, the specific capacity increased to 5.55 m^3/h per metre of drawdown at the same abstraction rate, demonstrating a significant improvement in borehole performance.

Figure 3: Franklaw Q1 borehole step test results pre and post remediation



Source: UUW data

3.2 How the risks are changing

3.2.1 The risks associated with deteriorating borehole assets are not static. They are intensifying over time due to a combination of expectations of environmental outcomes, climate change and security of supply and accelerating asset health risk. These factors align with the resilience and asset health challenges set out in our PR24 submission and reinforce the need for timely, proactive intervention.

Expectation of Environmental Outcomes

3.2.2 Environmental Destination (ED)[2] is a long-term water resources planning approach that determines how abstraction from surface water and groundwater must change to achieve a healthy water environment now and in the future. To meet ED targets, UUW is planning for 77,000 Ml/year of licence reduction from borehole sources, equivalent to an overall 40% reduction in borehole licences (UUW12 Long-term Delivery Strategy[3]).

3.2.3 This reduction increases reliance on the remaining groundwater assets, requiring further optimisation of existing sources. As a result, returning yield towards permitted abstraction limits and reducing unplanned outages (thereby increasing system headroom) is a key benefit of the proposed borehole cleaning and renewal interventions.

Climate change and security of supply/headroom

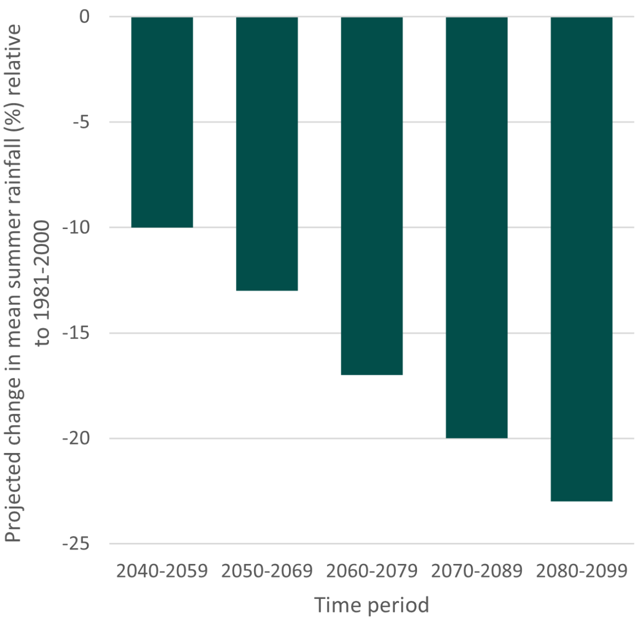
3.2.4 Figure 4 shows forecast reductions in mean summer rainfall under a central climate change scenario (RCP4.5), equivalent to +2°C of warming by 2050. This creates a material risk for UUW, given that over 90% of normal supply is derived from surface water, which is directly dependent on rainfall.

3.2.5 Reduced summer rainfall increases the likelihood of surface water scarcity, leading to greater water stress and increased reliance on groundwater sources. Boreholes are comparatively more resilient to short-term rainfall deficits and therefore play an increasingly important role in mitigating long-term security of supply and headroom risk, making their asset health progressively more critical.

3.2.6 This is supported by UKCEH research[5] indicating that extreme soil moisture droughts (90 days or longer) are expected to become more frequent under climate change, reducing surface water availability and slowing recharge. Events historically occurring once every 16 years could occur as often as once every three years by the 2060s and 2070s.

3.2.7 In this context, UUW must ensure that its planning and investing to maintain appropriate asset health, headroom and

Figure 4: Forecast changes in summer rainfall for the North West region for a central climate change scenario (RCP4.5)



Source: UUW Analysis of MetOffice UKCP18 dataset[4]

[2] Appendix D: Environmental Destination principles for protecting the water environment in water resources planning

[3] UUW12 Long-Term Delivery Strategy

[4] UKCP summaries and headline findings - Met Office

[5] Frequency and duration of soil moisture droughts set to increase under climate change | UK Centre for Ecology & Hydrology

system resilience to meet high-demand events and operate reliably under increasingly variable climatic conditions. This has been reinforced by high profile incidents observed and investigated in the sector.

Water quality

3.2.8 Deterioration of borehole linings can lead to elevated raw water turbidity, reducing water availability and increasing pressure on treatment processes. While treatment can mitigate this risk, a more efficient and resilient approach is to address deterioration at source through borehole cleaning and conditioning. [✂]Lining renewal and headworks replacement mitigate this risk by restoring integrity and protecting raw water quality.

Ageing assets and declining maintainability

3.2.9 As borehole assets continue to operate beyond their original design life, the relationship between asset condition and operational risk becomes increasingly non-linear. Many existing borehole headworks are located within subterranean confined spaces, presenting inherent health and safety risks and reducing maintainability. Maintaining yield at these sites requires increasingly complex operational interventions, adding to the complexity of inspection, maintenance and repair activities. Raising headworks is therefore a key benefit of the proposed remediation programme.

3.2.10 In addition to improving maintainability, raising headworks above ground reduces the risk of direct surface water ingress. Bringing the borehole asset base up to this standard is necessary to improve maintainability, protect against contamination and ensure boreholes remain viable sources of supply.

3.3 Why this is the right time to invest

3.3.1 The proposed programme is required now to move investment in the borehole asset base to a more sustainable level, addressing deterioration in both headworks and boreholes themselves. This investment supplements AMP8 base allowances, which are primarily focused on maintaining short-term operational reliability and security of groundwater sources.

3.3.2 The borehole estate is mature. Using corporate datasets covering asset performance, attribution and condition survey data, UUW has developed a company-wide asset health dashboard that enables analysis across all above-ground asset classes. This analysis, presented in Table 2 below, concludes that 45% of borehole assets are currently at end of life and without proactive intervention, the majority of the remaining assets will become life expired within the next 30 years, leading to declining efficiency, reduced achievable flows, and in some cases borehole abandonment. This would reduce system headroom, increase security of supply risk where boreholes provide a high proportion of supply, and heighten risks to raw water quality and aquifer protection if assets are not upgraded to prevent ingress. For full details of the asset health dashboard see Figure 8 and for details of the approach to analysis see Appendix C.

Table 2: Summary of assets at end of asset life

Scenario	Now	End of AMP8	End of AMP9	End of AMP10	End of AMP11	End of AMP12	End of AMP13
No proactive maintenance	45%	48%	54%	80%	81%	85%	86%

Source: UUW analysis

3.3.3 The scale of the estate (149 boreholes) and its complex integration within the wider water supply system requires careful production outage planning, coordinated with other asset maintenance and statutory inspections. Acting now enables the delivery of an efficient and achievable programme, allowing outages and investment to be spread across multiple AMPs, minimising service interruption, temporary reductions in headroom, and customer impact.

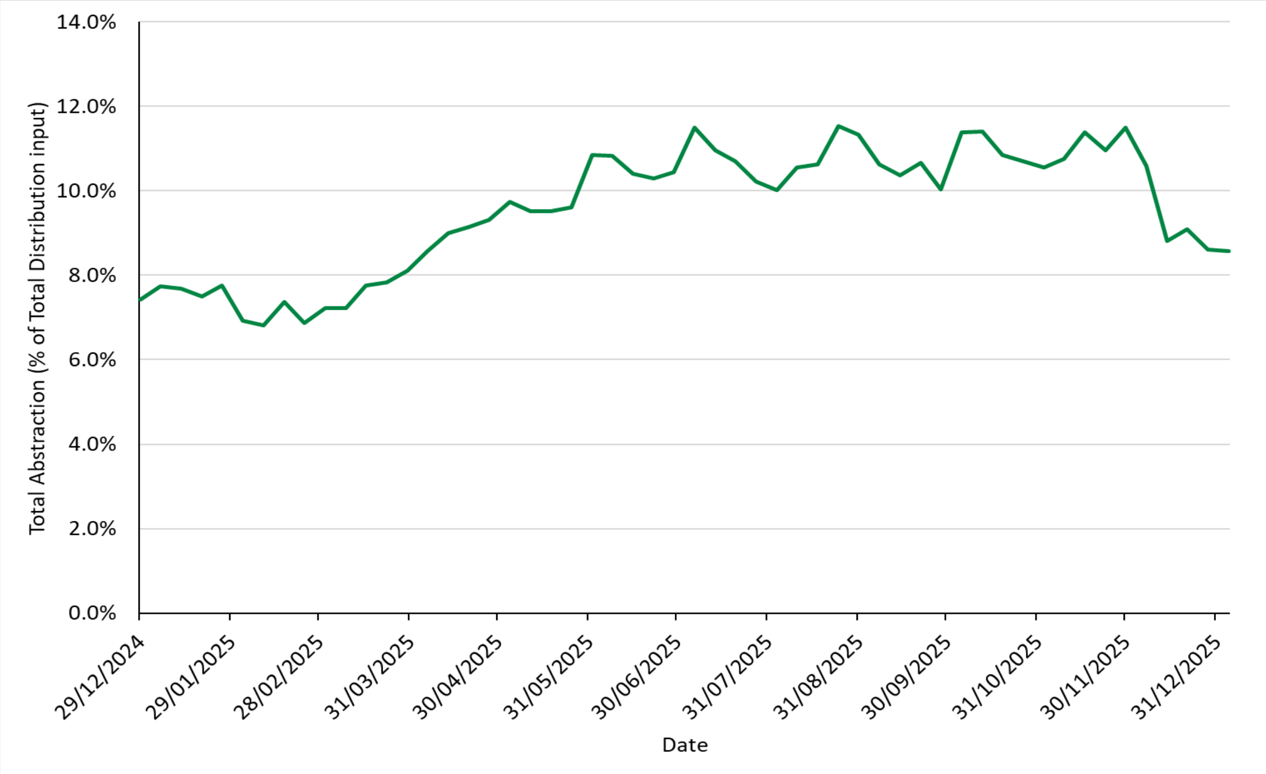
3.3.4 Given the proportion of assets already life expired, those forecast to expire within 30 years, projected population growth, climate-driven pressures, and the complexity of outage scheduling, investment must start now to secure long-term security of supply, headroom, water quality and safe operation.

3.3.5 Investment proposed for our borehole estate is required now to mitigate a set of material and increasing risks.

Security of supply/headroom

3.3.6 In an average climate year, the majority of water supply is derived from surface water sources. During extended dry weather and drought, borehole sources become increasingly important in supporting both local supply and the wider strategic water resources system. For example, during the 2025 drought, borehole usage increased from approximately 8% to between 10% and 12% of supply, equating to an additional around 50 Ml/d delivered consistently throughout the event as shown in Figure 5.

Figure 5: Graph showing increased borehole abstraction during 2025 drought event



Source: UUW analysis

3.3.7 Forecast changes in rainfall seasonality under a central climate change scenario (see Figure 4) indicate drier summers, placing increasing pressure on surface water resources. Boreholes therefore play a particularly important role in mitigating long-term security of supply and headroom risk, and the asset health and reliability of boreholes is becoming progressively more critical to system resilience.

3.3.8 Demand pressures are also increasing. The regional population has grown by 7% since 2006, with around one million additional people forecast by 2050, increasing demand for water services. In addition, UUW plans to support future regional demands aligned to the WRMP, including potential requirements from population growth, industrial demand such as data centres and clean energy, and options such as the Vyrnwy transfer.

3.3.9 Investing now will ensure that boreholes, where environmentally sustainable, are reliably available when required, helping to mitigate the combined risks from climate change, growing demand and increasing reliance on groundwater sources.

Water Quality/Reduce emerging risk of contamination

3.3.10 Enhancing borehole headworks will strengthen water quality integrity, reduce potential pollution pathways to the aquifer, and ensure safe and compliant operation. Acting now is necessary to ensure boreholes remain consistently available and that outputs from all environmentally sustainable sources can continue to be maximised in line with the WRMP.

Greater operational efficiency and resilience

3.3.11 Operational efficiency and resilience will be improved through expanded real-time monitoring of boreholes, including power usage, water levels, pressure and flow. Improved visibility of performance will support more proactive operational decision-making and more effective resource planning.

3.3.12 An improved and more sustainable approach would be delivered through increased blending of borehole sources, enabling better balancing of water quality, yield and system capacity. This provides greater operational flexibility to respond to changing demand conditions.

3.3.13 Optimising borehole pumps and ensuring each source operates sustainably will contribute effectively to strategic supply objectives. Optimisation of the existing fleet will be delivered through a targeted refurbishment programme based on asset condition and criticality, extending asset life. This will be supported by a proactive inspection regime, enabling earlier identification of risks and defects and reducing the likelihood of unplanned outages.

3.4 Evidence of deterioration

3.4.1 To evidence and understand the extent of deterioration across the borehole asset base, UUW has drawn on multiple complementary sources of information, including:

- Asset-based evidence, comprising CCTV surveys, geophysical inspections and headworks condition assessments; and,
- Data-led asset health forecasting, to understand risk progression over time.

Current State

3.4.2 During AMP7, UUW undertook extensive CCTV and geophysical surveys across the borehole estate. As a result, recent CCTV condition data is available for 90 operational boreholes, representing over 60% of the asset base. In addition, during the first year of AMP8, headworks condition surveys have been completed across the borehole inventory.

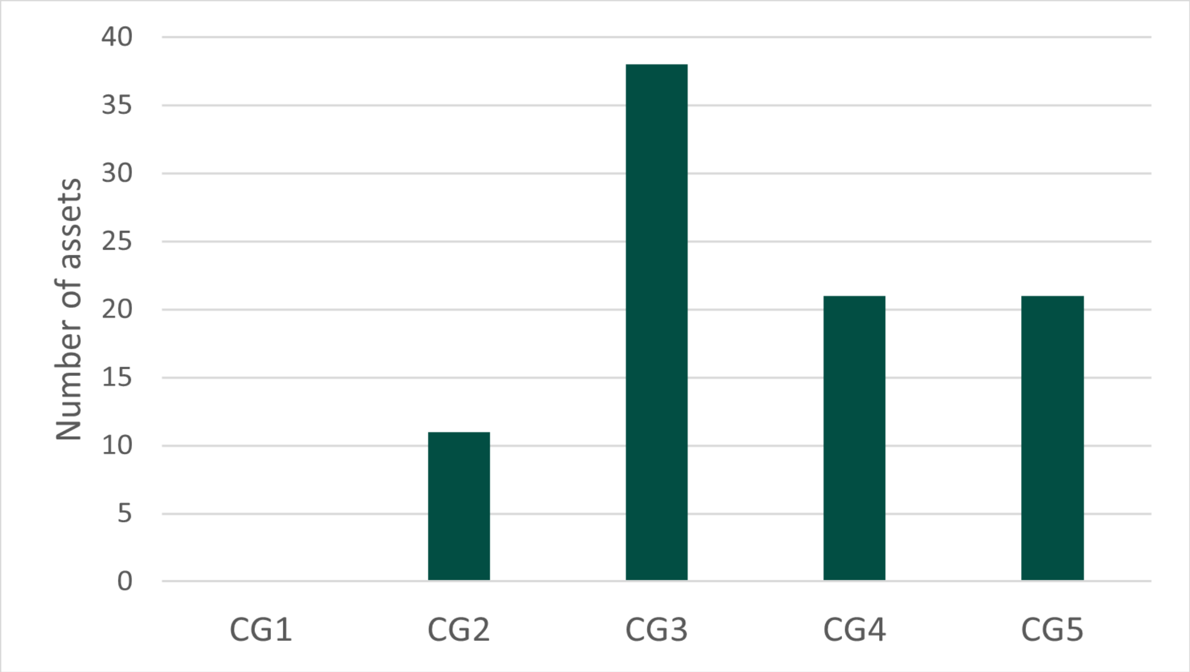
3.4.3 The condition grades of the bores presented in Figure 6 and the headworks presented in Figure 7 show the assessed conditions evaluated in line with Ofwat's issued condition assessment guidelines. These guidelines require the assessment of civil, mechanical and electrical components using a scale from Grade 1 to Grade 5, where increasing grades represent increasing levels of deterioration.

3.4.4 Grade 1 assets are in very good condition and require minimal intervention;

3.4.5 Grade 5 assets are in very poor condition, typically exhibiting significant defects and a high risk of failure.

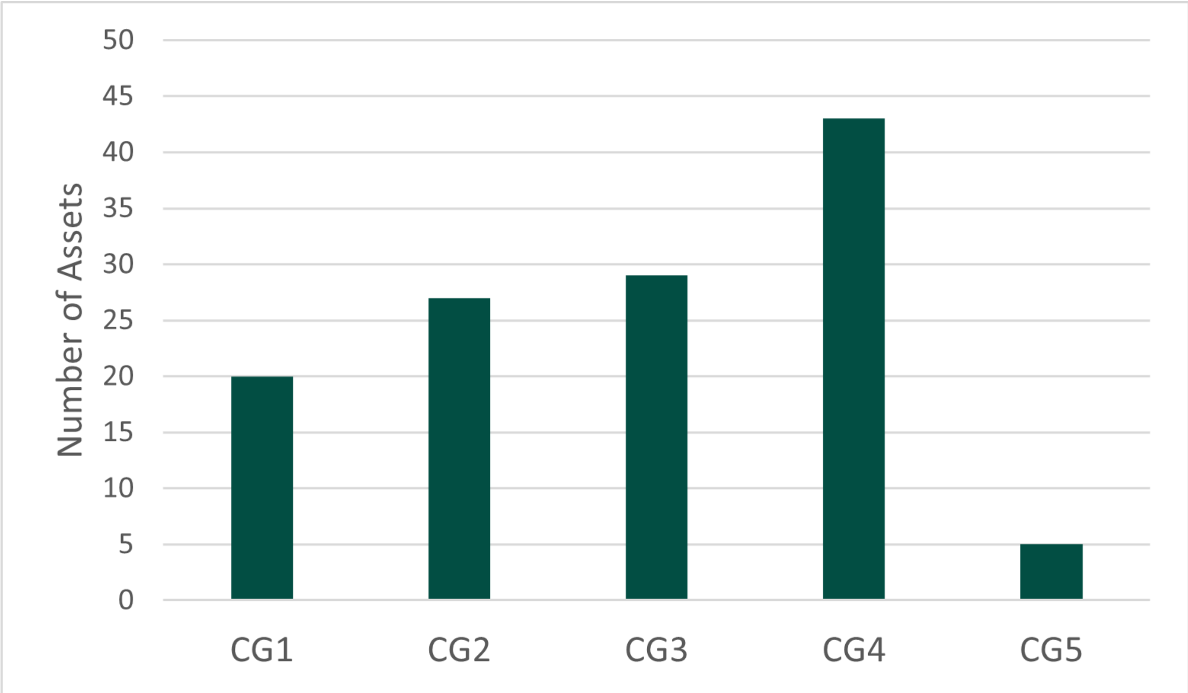
3.4.6 This evidence base has been used to identify priority assets and inform the targeted programme of interventions proposed within this business case.

Figure 6: Condition grade (CG) for 90 operational boreholes surveyed in AMP7



Source: UUW analysis of condition surveys (CCTV and geophysical)

Figure 7: Condition grade (CG) for borehole headworks surveyed in year 1 of AMP8



Source: UUW analysis of condition surveys

3.4.7 The condition assessment for the boreholes and their headworks, have been taken into consideration along with the future risk profile for the Boreholes.

Modelled Forecast - Base Asset Health Dashboard

3.4.8 Using corporate datasets covering asset performance, attribution and condition survey data, UUW has developed a company-wide asset health dashboard that enables analysis across all above-ground asset classes. Figure 8 presents the base asset health risk dashboard for boreholes, showing the replacement value and relative life expired of the borehole asset base. This is also summarised in Table 3 below.

3.4.9 The dashboard demonstrates the profile of a mature asset base that has received mixed renewal and refurbishment investment in recent years. While many mechanical and electrical components are assessed as mid-life, a significant proportion of civil and structural assets are reaching advanced age, with some exhibiting clear indicators of material degradation.

3.4.10 Under a baseline scenario with no proactive or reactive capital investment, the modelling indicates that the majority of the borehole asset base would become life expired within the next 30 years. A similar outcome is projected under continuation of the baseline capital maintenance programme alone. In contrast, the step change enabled by the proposed asset health investment materially reduces both the overall risk profile and the proportion of end-of-life structural assets over the 30-year forecast horizon.

3.4.11 Figure 8 presents Scenario A (top row of Figure 8), which models the borehole asset base over a 30-year period assuming no proactive or reactive investment, aligned to five-year AMP cycles. Under this scenario, asset deterioration continues unchecked: by 2035, over half of assets reach end of life, and by the end of the period over 86% of assets are end-of-life, with very few remaining in the early stages of life.

3.4.12 Scenario B (second row of Figure 8) reflects the impact of UUW's current AMP8 base maintenance programme, excluding the investment proposed in this case. While this funding provides some benefit compared to no investment, it does not adequately address long-term deterioration. By the end of AMP8, the proportion of end-of-life assets still increases by 2%, and although there are 8% fewer end-of-life assets by 2055 than under Scenario A, the overall profile continues to worsen, with more than 75% of assets end-of-life by 2055.

3.4.13 Scenario C (third row of Figure 8) shows the impact of the AMP8 base plan plus the proposed additional investment. This scenario begins to address the ageing profile by reducing the proportion of end-of-life assets by the end of AMP8 and deferring further deterioration until around 2035. While the profile remains skewed by 2055, with approximately 70% of assets end-of-life, the modelling provides clear evidence of the benefits of enhanced investment and the need to sustain higher funding levels to move towards more sustainable asset health to the benefit of customers. This also creates headroom to innovate and embed greater efficiency in future infrastructure planning.

3.4.14 Table 3 summarises the outputs of the asset health dashboard at the end of each five year assessment management period for each of the three tested scenarios.

Table 3: Summary of remaining asset life for borehole assets for each investment scenario

Scenario	Now	End of AMP8	End of AMP9	End of AMP10	End of AMP11	End of AMP12	End of AMP13
Scenario A: Do Nothing	45%	48%	54%	80%	81%	85%	86%
Scenario B: Base Maintenance Projection	45%	47%	52%	76%	76%	78%	78%
Scenario C: Proposed Investment Proposition	45%	39%	44%	65%	66%	69%	70%

Source: UUW analysis

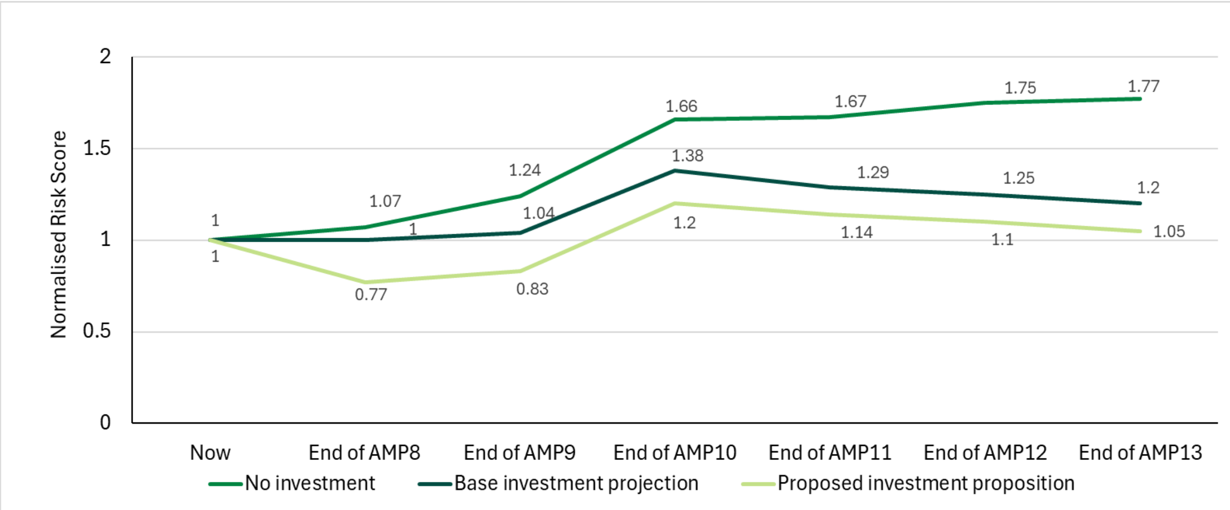
Figure 8: Scenario A – Asset health profile with no investment in borehole assets & Scenario B – Asset health profile with UUW's current AMP8 plan and Scenario C – Asset health profile with UUW's current AMP8 plan, plus the investment in this case

Source: UUW analysis

3.4.15 Figure 9 (below) summarises these impacts as a normalised service risk profile, showing the proportion of assets at end of life over time.

3.4.16 With no investment, risk increases by 42% by the end of AMP9. Under the existing AMP8 base programme, performance remains stable through AMP9 but still represents a 17% increase in service risk from the current position. In contrast, the proposed additional AMP8 investment reduces normalised risk by 9% by the end of AMP8, representing a 27% improvement compared to the AMP8 base plan and 37% compared to the do-nothing scenario. Supporting calculations are provided in Table 23 and Table 24 alongside the details of our dashboard in Appendix C.

Figure 9: A line chart comparing how the risk score would change through future AMPs based on the three scenarios discussed, normalised to current risk



Source: UUW analysis of risk as a result of asset deterioration

3.4.17 In addition to the asset-level benefits captured by the modelling, there are system-wide efficiencies not directly represented. As the proportion of end-of-life assets increases, impacts on system capability, operational resources and maintenance efficiency grow non-linearly. The proposed investment therefore delivers compound long-term benefits, supporting more effective and efficient operation and maintenance of the borehole estate.

3.5 Our existing strategy and base programme

3.5.1 In line with its approach across asset classes, UUW applies both proactive and reactive asset health management to the borehole estate.

3.5.2 Proactive management is underpinned by a structured inspection and monitoring regime, including CCTV surveys, geophysical assessments and water quality analysis, where appropriate. During AMP8, UUW plans to survey 68 of the 149 operational boreholes, delivered as part of a rolling multi-AMP inspection programme, consistent with the Drinking Water Inspectorate (DWI)'s recommendations.

3.5.3 These inspections provide the primary evidence base for borehole asset health management. Survey outputs are used to identify urgent maintenance needs, inform prioritisation of routine maintenance, and support longer-term investment planning across the borehole fleet. In parallel, UUW uses routine performance, efficiency and water quality data to monitor emerging risks associated with borehole operation. Any of these data sources can trigger direct intervention or escalation through established governance routes, including the Drinking Water Safety Plan or UUW's tiered risk escalation process.

3.5.4 Where asset health interventions are identified for delivery within in-AMP base allowances, funding is allocated through a number of capital maintenance block programmes designed to address emerging risks. Borehole capital maintenance requirements are balanced alongside other business priorities and regulatory drivers; as a result, funding blocks supporting borehole needs are not always ring-fenced specifically to borehole assets.

3.5.5 UUW applies multiple prioritisation processes to support consistent and proportionate decision-making, including:

- CATCHREV, for proactive prioritisation of base-funded interventions on catchment and water resource assets;
- HAZREV, for proactive prioritisation where asset condition poses a risk to drinking water quality; and,
- Fix-on-fail, for reactive base-funded interventions in response to asset failure or material underperformance.

3.5.6 In addition, there are periods when the availability and yield of groundwater become critical to overall system performance. For example, during the prolonged dry weather in 2025, surface water sources from rivers and reservoirs were significantly constrained. During this period, maintaining output from groundwater boreholes was essential, as these assets are typically less sensitive to short-term rainfall deficits. Base investment in borehole assets increased during this event, helping to ensure that asset health did not compromise continued supplies to customers. We have therefore already spent a portion of our AMP8 base allowances through the management of drought risk in 2025.

3.5.7 In our AMP8 programme we have allocated base funding to cover proactive investment on boreholes following our planned inspection programme. This expenditure on proactive interventions will be ringfenced through a base expenditure PCD in line with the aggregate what base buys figure across the relevant asset classes in this submission. Further details of our analysis of What Base Buys is contained within Section 4. A detailed breakdown of the proposed ringfenced base expenditure PCD is presented in Section 7.

3.5.8 Our expenditure on refurbishments and replacements was £18m on average per AMP across FY2015/16-FY2024/25, therefore we are confident that we will spend the calculated implicit allowance of £6m for boreholes.

Risk Management

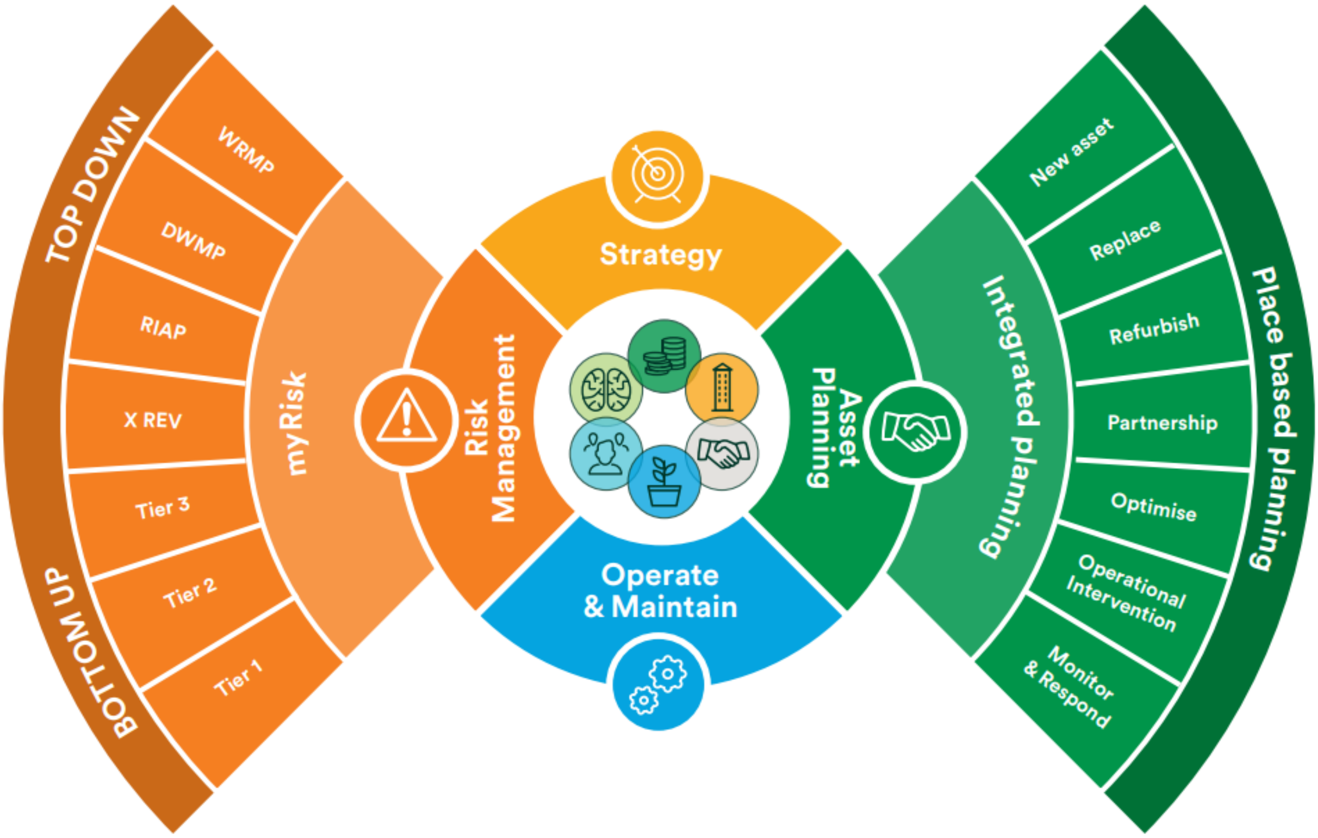
Risk identification, assessment and escalation

3.5.9 We manage operational and asset health risks through an enterprise-wide risk management framework that provides a clear golden thread from asset-level risk identification to Board-level oversight. This is delivered through our Risk and Asset Planning (RAP) process, as set out in our Strategic Asset Management Plan (SAMP), and was assessed by Ofwat through the PR24 Final Determination and AMMA processes.

3.5.10 Operational risks are identified at asset and site level through routine condition assessments, performance monitoring and operational experience. These risks are recorded in myRisk, United Utilities' corporate risk management system, which assesses likelihood and consequence across safety, environmental, service and financial dimensions. Risks are scored against defined criteria and supported by documented controls and mitigation actions. Where risks exceed tolerance thresholds, they are escalated through formal governance routes for prioritisation and intervention.

3.5.11 An illustration of this approach is in Figure 10 below.

Figure 10: Risk and Asset Planning bowtie diagram



Source: UUW analysis

Integration with corporate risk governance

3.5.12 The myRisk system operates as the bottom-up risk capture mechanism and is fully integrated with our wider corporate risk framework. Operational risks recorded in myRisk are aggregated and reviewed through regular six-monthly risk review cycles, informing the strategic risks managed through our corporate risk system. This ensures alignment between operational reality and corporate risk appetite, enabling informed decision-making on investment prioritisation and risk trade-offs at both executive and Board level.

3.5.13 This integrated approach ensures that asset health risks are not considered in isolation, but alongside other material business risks, including regulatory compliance, environmental performance, health and safety, and resilience to climate change. The framework enables the company to identify where reliance on reactive or temporary controls is increasing, signalling the point at which proactive capital intervention represents the most efficient and lowest-regret response.

Alignment with asset management standards and PR24 commitments

3.5.14 Our risk management approach is embedded within our ISO 55001:2024 certified Asset Management System and is set out in our SAMP. The SAMP defines how risks are identified, evaluated, escalated and mitigated across the asset lifecycle, linking long-term strategic objectives to short-term operational decision-making. This framework underpins the company's AMP8 asset health and resilience strategy and provides assurance that investment decisions are evidence-led, proportionate and targeted at the highest-risk assets.

3.5.15 As described in Chapter 7 of our PR24 submission[6], we use asset risk modelling, operational risk management processes and structured assurance to manage current and emerging asset health risks.

[6] *UUW PR24 Submission, Chapter 7, Section 7.6: UUW07 Chapter 7 Resilience and asset health*

However, where deterioration becomes non-linear and constrains safe operation or maintainability, the effectiveness of operational controls reduces and reliance on reactive intervention increases. In these circumstances, proactive capital investment is required to restore risk to tolerable levels and maintain alignment with the company's stated risk appetite.

Proactive risk management

3.5.16 We work to avoid disruption that negatively impacts customers or the environment now and in the future. We do this by proactively managing risk associated with our assets, systems and processes, with control and mitigation focusing on preventing or limiting problems, while maintaining the capacity to respond effectively.

3.5.17 Many of our proactive risk management capabilities cut across multiple operational risks. More detail of our approach to risk management can be found in chapter 7 of our main PR24 submission[7], including details on asset risk modelling, managing operational risks, and our approach to asset health.

3.6 Our historical investment

3.6.1 Investment in the borehole asset base over recent AMPs has been focused on:

- Managing and improving system resilience;
- Developing a robust understanding of asset condition and performance; and
- Maintaining operational reliability.

3.6.2 In line with its approach across asset classes, UUW applies both proactive and reactive asset health management to boreholes. Where an asset health intervention is identified, base funding is allocated to support the required works. These interventions are balanced against wider business priorities and regulatory requirements, using established prioritisation processes to ensure a proportionate and risk-based approach.

3.6.3 Historic borehole expenditure has been derived from Ofwat's industry-wide *Workload and Expenditure dataset*, which consolidates data from four primary systems:

- SAP – current above-ground asset inventory and work management;
- MAMS – legacy above-ground asset inventory and work management;
- CPMS – capital project reporting; and,
- APR – Annual Performance Review regulatory submissions.

3.6.4 Within this dataset, interventions are categorised into repair, refurbishment, replacement and other. Repair activity is captured through SAP (FY2016/17–FY2024/25) and MAMS (FY2015/16–FY2017/18) work order data, while refurbishment, replacement and other interventions are derived from CPMS project data and SAP asset registration records for FY2017/18–FY2024/25.

3.6.5 In line with Ofwat's *Enhancing Asset Health Understanding Roadmap – Workload and Expenditure* guidance, expenditure is reported in the year incurred, while outputs are reported in the year delivered. This approach results in limited alignment between expenditure and outputs in any given year. In addition, while most data is aligned to regulatory financial years, some project-level output data has been extracted by calendar year, which may result in minor year-on-year comparison inconsistencies.

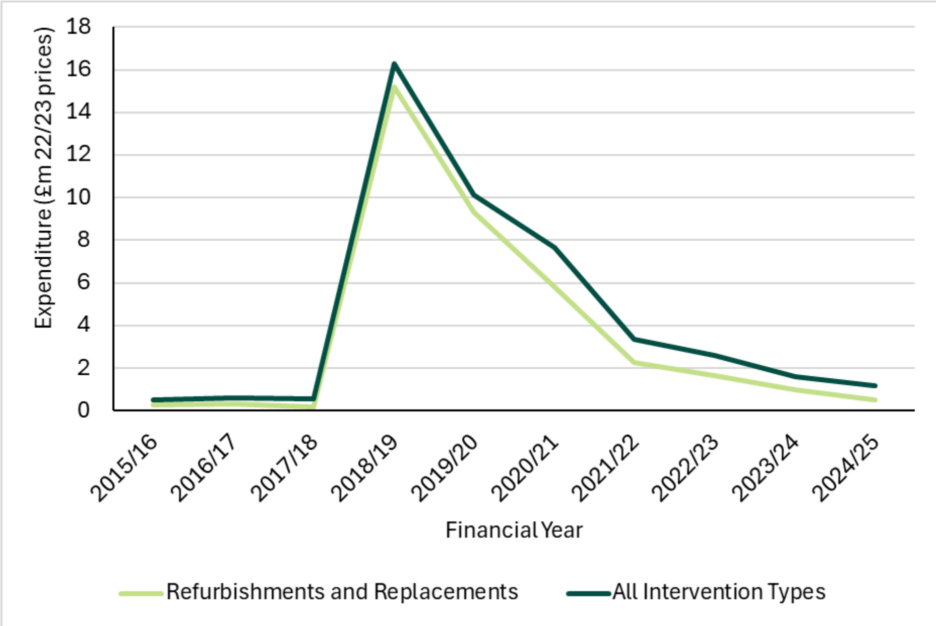
3.6.6 Figure 11 presents the historic spend profile for FY2015/16 to FY2024/25, during which UUW invested £44.5 m in borehole assets. Cumulative spend by intervention type over this period was:

- Repairs: £6.5 m
- Refurbishment: £36.6 m

[7] UUW07 Chapter 7 Resilience and asset health

- Replacement: £0
- Other: £1.3 m

Figure 11: UUW legacy expenditure on boreholes[8]



Source: UUW analysis

3.6.7 In 2018-19, expenditure was driven primarily by refurbishment of the [✂] boreholes, which were reinstated as business-as-usual sources following the 2018 drought. At the time of that drought, the boreholes were not at sufficient operational readiness to be deployed, reflecting their role as non-primary sources (typically around 8% of supply under normal conditions). Higher-than-typical refurbishment costs were incurred to secure water supply when these assets became more critical during drought conditions.

3.6.8 Subsequent investment focused on other boreholes assessed as the poorest condition and highest criticality. Further refurbishment works were also undertaken at [✂]to align assets with an updated borehole asset standard, developed following lessons learned from the 2018 drought. This standard ensures boreholes are maintained at a higher level of operational readiness and resilience during adverse weather events.

3.6.9 In 2020-2021, refurbishment continued to be the main driver of expenditure, reflecting multiple headworks refurbishments required to bring previously out-of-service boreholes back into operation. From 2021-22 onwards, expenditure levels increased relative to earlier years, primarily due to progressive asset deterioration across the borehole estate driving higher refurbishment requirements, alongside broader cost pressures such as an increased operational readiness requirement of idle boreholes and inflation.

[8] Ofwat (2026). Sector workload and expenditure dataset v2 - for circulation.

4. Determining What base buys (WBB)

This section explains how much investment is already implicitly funded through base allowances, and how the additional investment proposed ensures that customers are not paying twice.

4.1 Purpose of WBB

4.1.1 WBB represents the level of investment in asset maintenance and renewal that Ofwat assumes to be implicitly funded through PR24 base expenditure allowances. We calculate WBB in order to ensure that our investment proposals are not duplicative of those allowances and, therefore, represent genuine additional investment that has not been previously funded.

4.1.2 In developing asset health investment proposals, any additional asset health investment proposed through the cost change process should reflect the true incremental investment above and beyond WBB. This is informed by an assessment of the capital maintenance activity planned for each relevant asset class in AMP8, and an evaluation of the extent to which this activity can reasonably be delivered within existing base allowances.

4.1.3 The value of the cost change claim therefore comprises of the incremental investment requested net of the implicit allowance (WBB). This supports transparency and ensures that customers are not paying twice for the same investment.

4.2 Limitations of WBB

4.2.1 It is important to note that at PR24 Ofwat set allowances across the entire asset base. Under the current totex-based regime, companies are given discretion to allocate base allowances across their asset base in line with efficient operational priorities, rather than to deliver predefined levels of investment in each specific asset classes.

4.2.2 As a consequence, there is no established approach to estimating WBB for specific asset classes. It is therefore important to recognise the limits of any mechanistic approach used to assess WBB for individual asset classes. Importantly, Ofwat has acknowledged that "there is no perfect way to determine what base buys"[9].

4.2.3 Assessing WBB *ex-post* after the Final Determination for specific asset classes requires making several key methodological assumptions and apply some judgement. It is difficult to robustly estimate WBB because:

- Base expenditure allowances are set in aggregate across the asset base;
- There is a lack of consistent cost definitions across the industry;
- There is a lack of comparative data that can be used to perform robust benchmarking;
- The funding needs for a specific asset class vary over time reflecting companies' specific asset cycles; and,
- The funding needs will depend on the asset strategy adopted by companies for each asset class.

4.2.4 In light of this, in assessing different approaches, we have set out the key risks and limitations associated with the data available for calculation of WBB in the supplementary document *UUW26-18 Asset Health – What base buys methodology.*

4.2.5 In applying any methodology, Ofwat should give significant consideration to the risk of an overstatement of WBB and the potential impacts this could have on restricting companies' base

[9] Ofwat (2025). Asset Health Investment Assessment Guidance. Available at: https://www.ofwat.gov.uk/wp-content/uploads/2025/12/Asset-Health-Assessment-Guidance.pdf, pg. 21.

expenditure decisions in a way that would be inconsistent with the PR24 approach to base expenditure allowances.

4.2.6 Our view is that the methodology presented in this document very much represents the upper end of the range that should be considered for WBB and that, in view of the risks associated with over-estimation, Ofwat should consider whether lower limits should be binding on companies. This may be particularly appropriate in the event that Ofwat applies the same methodology broadly across all companies.

4.2.7 Examples of potential mitigations that Ofwat could consider are set out in the supplementary document *UUW26-18 Asset Health – What base buys methodology.*

4.3 Calculating WBB

4.3.1 Despite these limitations, we have calculated our WBB in line with the principles set out by Ofwat and ensured that industry benchmarking is used alongside externally verifiable data. This is set out Table 4 below and explained in further detail in our full methodology which is set out in the supplementary document *UUW26-18 Asset Health – What base buys methodology.*

4.3.2 We present three potential approaches to calculating WBB in Table 5. Our assessment of each approach is also set out in the supplementary document *UUW26-18 Asset Health – What base buys methodology.* Following this assessment, we concluded that the bottom-up approach is most aligned to these principles. Therefore, all WBB numbers presented are calculated following this methodology.

4.3.3 Based on our approach to calculating the requirements as set out by Ofwat on WBB, the implicit funding allowance for boreholes is £6.4m over AMP8. As discussed in Section 4.2, this represents the upper end of a plausible range.

Table 4: Alignment with WBB principles [10]

Principles of WBB	Approach's alignment with principle
Avoid the risk of customers paying twice for investment, once through existing base allowances and once through any additional adjustments	✓
Have a clear rationale, and where possible, is consistent with the way allowances are set during the price review	✓
Acknowledges that companies receive long-term base allowances, and that spend on an asset class across periods is likely to vary over time	✓
Is informed by good quality information, and where there are limits to this, is aware of data limitations	✓
Uses externally verifiable data	✓
Relies on an industry benchmark rather than a company specific view	✓

Source: UUW analysis of Ofwat's Asset Health Investment Assessment Guidance (2025)

[10] Ofwat (2025). Asset Health Investment Assessment Guidance. Available at: https://www.ofwat.gov.uk/wp-content/uploads/2025/12/Asset-Health-Assessment-Guidance.pdf.

Table 5: Summary of different approaches assessed[11]

Approach	Description
Bottom-up approach	Adjusting sector average/median outturn AMP6 and AMP7 capital maintenance expenditure related to the priority asset class to the increase in base expenditure allowances provided at PR24.
Econometric based approach	Remove historic capital maintenance expenditure related to priority assets from PR24 base expenditure econometric benchmarking models to estimate implicit level of funding in modelled allowances associated with priority asset classes.
Historic company-specific expenditure approach	Scale company-specific historic capital maintenance expenditure on priority asset classes to PR24 base expenditure allowances and use each company's historic expenditure shares rather than industry-wide averages to estimate the implicit level of base funding associated with those assets.

Source: Ofwat's Asset Health Investment Assessment Guidance (2025)

4.3.4 The bottom-up approach estimates the borehole specific WBB by identifying the industry average share of modelled base historical expenditure allocated to borehole refurbishment and replacement. This share is applied to UUW' AMP8 wholesale water base allowance to derive an implicit borehole allowance. The mean and median estimates are triangulated to reduce sensitivity to outliers and provide a robust implicit allowance.

4.3.5 The approach involves the following steps:

- **Step One**: Sum historical asset expenditure
  - Sum all refurbishment and replacement expenditure for boreholes across the full dataset period (2015/16–2024/25) - *Source: Workload and Expenditure Dataset (06/02/2026).*
- **Step Two:** Sum modelled historical base expenditure
  - Sum a company's modelled base expenditure over the same period for Wholesale Water- Source: Ofwat PR24 Base Costs Water Model 3 – 'Costs' sheet*12*
- **Step Three:** Calculate historical spend shares
  - Divide the summed borehole historical expenditure (Step 1) by the summed modelled historical expenditure (Step 2).
  - This allows us to obtain a percentage share of modelled base historical expenditure on boreholes for each company.
- **Step Four:** Calculate the industry mean of this percentage share
- **Step Five:** Apply the mean share to AMP8 allowances
  - Multiply each company's AMP8 base allowance by the mean percentage derived in Step Four.
  - AMP8 allowances are taken from *Base Costs Water Model 3 – 'final allowance'13*, adjusted using the cumulative net price change for each year (from the *Base Costs Aggregator Model14*) to reflect post-frontier-shift and RPE-adjusted allowances.

[11] Ofwat (2025). Asset Health Investment Assessment Guidance. Available at: https://www.ofwat.gov.uk/wp-content/uploads/2025/12/Asset-Health-Assessment-Guidance.pdf

[12] Ofwat (2024). Cost assessment models: Base costs – water model 3, 'Costs'. Available at: Base costs – water model 3.

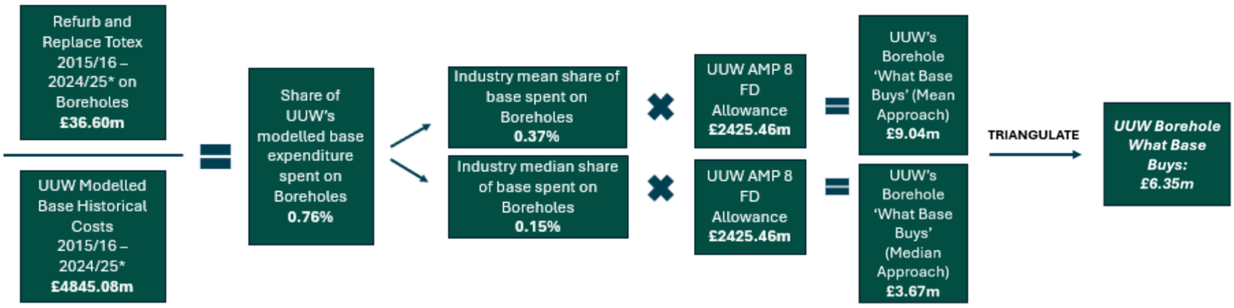
[13] Ofwat (2024). Cost assessment models: Base costs – water model 3, 'Final Allowances'. Available at: Base costs – water model 3.

[14] Ofwat (2024). Base Costs aggregator model. Available at: Base costs aggregator model

- **Step Six:** Repeat step four for the industry median
- **Step Seven:** Apply the median share to AMP8 allowances:
  - Multiply each company's AMP8 base allowance by the median percentage.
  - This follows the same process as Step Five
- **Step Eight:** Triangulate results:
  - Average the mean-based and median-based estimates to form the final AMP8 implicit allowance for boreholes.

4.3.6 Figure 12 provides the calculation process for the borehole implicit allowance.

Figure 12: Calculation of the borehole AMP8 implicit allowance



Source: UUW analysis of Ofwat (2026) Sector workload and expenditure dataset v2 – for circulation.

4.4 Summary of our proposal

4.4.1 To demonstrate that our cost-change claim is incremental, we propose an expenditure-based Price Control Deliverable in Section 7.1 that would protect customers from non-delivery and claw back unspent allowances for WBB across the asset classes.

4.4.2 Given the limitations highlighted in Section 4.2 and the supplementary document *UUW26-18 Asset Health – What base buys methodology,* we consider that our assessment of WBB represents the upper end of a plausible range. In light of the risks associated with over-estimation, it is therefore important that Ofwat considers the potential implications for constraining companies' base expenditure decisions.

4.4.3 We plan to report in our Annual Performance Report the amount of expenditure for each relevant asset class as per Ofwat's latest proposals on companies' reporting requirements[15].

4.4.4 In Section 7.1 we propose that the base expenditure PCD covers all relevant asset classes of the investment proposal so that if the expenditure in one asset class is less that its implicit funding allowance, but it is offset by a higher expenditure in one of the other asset classes, there would be no net PCD clawback. This would provide sufficient flexibility to ensure that companies remain incentivised to target their maintenance interventions efficiently whilst providing appropriate customer protection.

4.4.5 Further examples of potential mitigations that Ofwat could consider, reflecting the risk of over-estimation and the upper-bound nature of these WBB estimates, are set out in the supplementary document *UUW26-18 Asset Health – What base buys methodology.* We would be happy to discuss the merits of any such approaches with Ofwat.

4.4.6 The cost-change claim is for activities above this implicit level of base expenditure, and for this we propose an output-based PCD as set out in Section 7.1. Overall, this approach provides transparency and accountability and ensures that customers are appropriately protected.

[15] Ofwat, Consultation on regulatory reporting for the 2025-26 reporting year, December 2026 can be found here.

Table 6: WBB and Cost Change Claim: Boreholes (£m, 2022-23 CPIH prices)

	WBB	Cost Change Claim*	Total Allocated Spend in AMP8
Boreholes	6.4	13.3	19.7

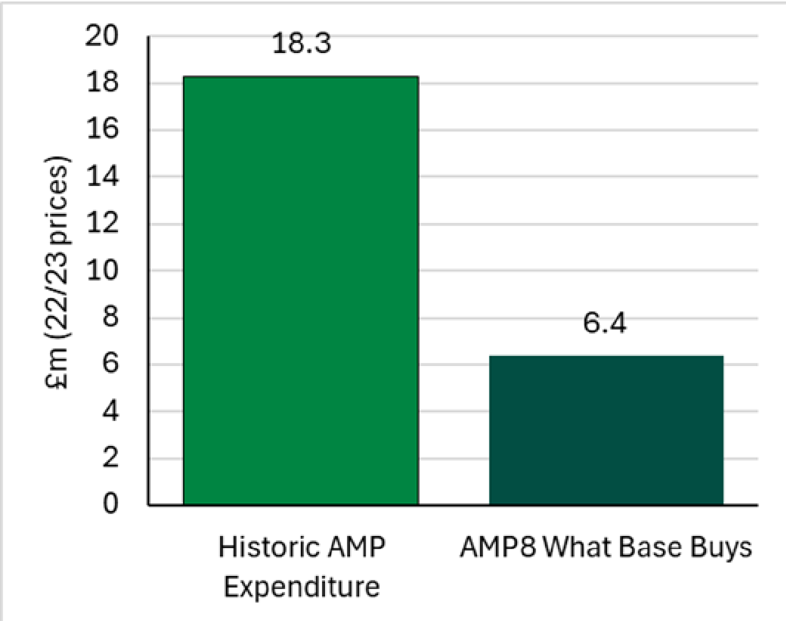
Source: UUW analysis of What Base Buys using Ofwat (2026) Sector workload and expenditure dataset v2 – for circulation.

**net of repair savings*

4.5 Comparison with historical expenditure

4.5.1 UUW has historically spent a large proportion of its base expenditure on boreholes compared to the industry benchmark. As shown in Figure 13, our historical base expenditure exceeds our calculated AMP8 WBB allowance which represents the high end of a plausible range. This illustrates a strong track record of investing our base allowances, providing confidence that customers are not paying twice.

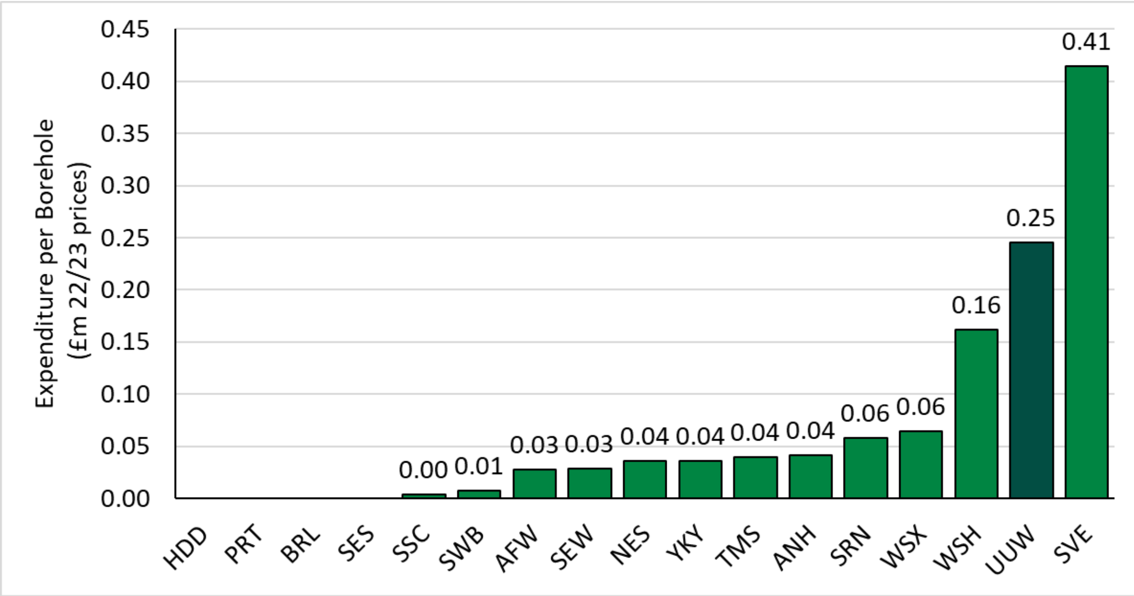
Figure 13: Comparison of average historical expenditure per AMP with AMP8 WBB, boreholes



Source: UUW analysis of Ofwat (2026) Sector workload and expenditure dataset v2 – for circulation.[16]

4.5.2 UUW has spent a significant amount per borehole on capital maintenance relative to the industry, which provides further confidence that we are committed to spending our implicit allowances in AMP8. This is illustrated in Figure 14 below.

Figure 14: Expenditure per borehole on refurbishments and replacements (2015/16-2024/25)[16]



Source: UUW analysis of Ofwat (2026) Sector workload and expenditure dataset v2 – for circulation.

[16] Ofwat (2026) Sector workload and expenditure dataset v2 – for circulation.

5. Best option for customers

This section demonstrates how we have developed the preferred programme via a robust optioneering process, tested our programme for value, assessed its benefits and how it is been informed by customer research and stakeholder engagement.

5.1 Our proposals are based on robust optioneering

5.1.1 UUW has undertaken structured optioneering to identify the most appropriate way to deliver a reduction in risk associated with boreholes. The purpose of this process was to ensure that the proposed AMP8 cost change programme for asset health represents a proportionate, deliverable and efficient response to the need.

5.1.2 The proposed programme has been shaped by three primary considerations:

- Current levels of asset health risk: interventions have been prioritised where there is confirmed poor asset condition from both operational experience and recent visual or CCTV inspections and in alignment with our Drinking Water Safety Plan risk assessments;
- Deliverability within AMP8: only interventions that can be designed and constructed within the AMP8 period have been included; and,
- Alignment with asset strategy: consideration of the long-term need for the assets and alternative growth.

5.1.3 The optioneering process was undertaken in two stages. We used unconstrained optioneering to confirm the site-specific need and alignment to the requirements for inclusion within the asset health cost change process. We then applied constrained optioneering to develop options that represent a credible, proportionate and deliverable solution within AMP8.

5.2 Unconstrained optioneering – sites considered

5.2.1 All 149 boreholes were assessed against asset health condition data. A combination of existing CCTV surveys and new visual headworks surveys was used. Data was then triaged and those sites with assets that met the cost change requirements were progressed for design and estimating. The outcome from the unconstrained optioneering stage included 24 boreholes on 17 sites. These assets that passed the first stage filter were then assessed against credible alternatives, including refurbishment and renewal.

5.2.2 The preferred options were then subject to a value assessment to demonstrate the best balance of risk reduction, whole-life cost while aligning with customer preferences. This process ensured that the proposed programme was developed from a structured and evidence-based optioneering process.

5.2.3 Boreholes associated with uncertainty over long-term operational use have been excluded from the proposed programme. This includes boreholes subject to WINEP investigations, where abstraction licences may be capped or revoked in the future. Additionally, sites that are currently not utilised due to water quality or other operational considerations have also been excluded from further consideration in this process.

5.2.4 Condition grade surveys were undertaken on the headworks of all active boreholes within the company's asset inventory. In addition, CCTV survey data (90 sites) undertaken since 2016 were reviewed to inform the assessment. The headworks condition surveys identified boreholes requiring headworks renewal, while the CCTV surveys highlighted those assets requiring structural cleaning or redrilling.

5.2.5 Boreholes assessed as having a condition grade of 4 or 5 were flagged for further expert review. In total, 77 boreholes were identified within these condition categories, representing approximately 52% of the total asset inventory. It is not operationally feasible to remove 52% of boreholes from service within the three-year asset health delivery timeframe (to 31 March 2030), as this would result in unacceptable levels of service disruption and would exceed the deliverability capacity of the two specialist contractors available to undertake this work.

5.2.6 As a result, we identified interventions across the 77 boreholes for a multi-AMP delivery programme, commencing in the current AMP period and targeting the highest priority assets first. Our prioritisation focused on boreholes presenting the greatest risk as identified in the Drinking Water Safety Plans.

5.2.7 For boreholes, many needs will only have two options, deferred investment or a condition driven refurbishment or renewal. The impact of the AMP8 deliverability constraint is significant as we have limited the size of our proposed programme to ensure that it is deliverable in the AMP8 timeline, a key requirement for additional asset health investment this AMP. The reason for not being able to deliver a larger programme this AMP is due to the level of complex integration boreholes have in our water supply system; this requires careful production outage planning and scheduling, including accounting for maintenance needs of other water production assets including independent statutory inspections. For further details on the process flow used to arrive at the intervention options see Figure 1 on page 9 and for the outcomes for this assessment for each of the 149 boreholes see Appendix A.

5.3 Constrained optioneering – interventions considered

5.3.1 Each shortlisted borehole investment need has been assessed against the following options:

(a) **Refurbishment (clean bore, reline bore)**: This will be represented by a lower capex current option than a full renewal of the bore, with a reduced life until a future renewal. The risk profile will remain low throughout the investment horizon. Whilst we investigated different options for structural cleaning of the boreholes, there was very little cost differential between the techniques.

(b) **Renewal (new headworks, redrill bore):** This will be represented by a higher capex current option. The risk profile will remain low throughout the investment horizon.

5.3.2 The proposed programme comprises a combination of refurbishment and renewal interventions aimed at addressing asset health and maintaining operational resilience. Refurbishment activities include the structural cleaning of boreholes, while renewal interventions comprise the redrilling of boreholes and the replacement of existing headworks.

5.3.3 In some boreholes we propose to complete both a refurbishment and renewal intervention, through borehole cleaning and new headworks. These boreholes are [✄].

5.3.4 We are planning a flexible programme for delivery of this work. This will ensure that a steady cadence of outputs through the remainder of the AMP, whilst protecting headroom across the region.

5.3.5 Evidence of customer preferences in relation to investment can be found in Section 5.5. Customers preferred long term solutions and for expenditure to support longevity and reliability, as opposed to cheap temporary fixes. They also sought minimal disruption to service, both during normal operations and interventions. These preferences are incorporated into our approach to outage planning for the proposed solutions.

5.3.6 Table 7 below details the complete list of boreholes and the proposed scope of works. We propose a total of 22 renewal interventions, comprised of 18 new headworks and 4 redrilling of boreholes. We also propose 5 refurbishments through borehole cleaning interventions. The total capex for the proposed solutions totals £13.5m in 2022-23 prices.

Table 7: Boreholes and proposed interventions in AMP8 programme

Borehole	New Headworks	Borehole Cleaning	Renew / Redrill
[✂]	x		
[✂]	x		
[✂]		x	
[✂]			x
[✂]			x
[✂]		x	
[✂]	x		
[✂]	x	x	
[✂]	x		
[✂]	x		
[✂]	x	x	
[✂]	x	x	
[✂]	x		
[✂]	x		
[✂]	x		
[✂]	x		
[✂]	x		
[✂]	x		
[✂]	x		
[✂]			x
[✂]			x
[✂]	x		
[✂]	x		
[✂]	x		

Source: UUW asset inventory

5.4 Best value assessment

5.4.1 For this submission, we have used a valuation tool that evaluates the most cost-beneficial approach out of a 'refurbishment', a 'replacement' or a 'do nothing' approach. This analysis draws on our work to develop a broader "six capitals" based valuation approach to reflect changes in regulatory and government approaches to valuations of service, the environment and amenity values.

5.4.2 The preferred option for each borehole has been selected based upon the condition state and the associated failure modes, rather than a formal cost benefit analysis. The cost benefit analysis has been applied to the preferred option to demonstrate that it is cost beneficial.

5.4.3 This assessment has been used to assess the constrained options identified through the optioneering process and to help to define a proportionate and deliverable preferred AMP8 cost assessment borehole programme. The outcome of the best value assessment supports a mixed programme dominated with refurbishment options. This helps to maximise the value from existing assets and to protect customers from unnecessary cost and risk.

Our Approach

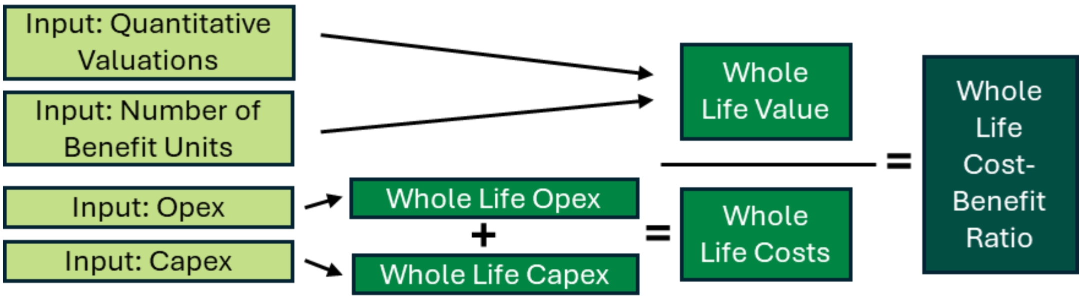
5.4.4 Our approach comprises three key steps as summarised below:

- Step 1 - calculating the whole life value;

- Step 2 - calculating the whole life cost; and,
- Step 3 - comparing the whole life cost-benefit ratio across different solutions.

5.4.5 These steps are described in further detail below, with the calculation of the whole life cost-benefit ratio depicted in Figure 19.

Figure 15: Cost benefit analysis flow diagram



Source: UUW analysis

Whole life value

5.4.6 We calculate whole life value of an investment solution as the present value of the total benefits accrued over a 30-year assessment period. This is derived by:

- multiplying the number of projected benefit units from the investment solution by the annual quantitative valuation; and,
- calculating the compounded value over the investment horizon and discounting it using the Social Time Preference Rate, in line with the HM Treasury Green Book.

5.4.7 Value-based decision making is informed by the six capitals framework, drawing from the internationally adopted Integrated Reporting and using a broad range of metrics that cover:

- natural capital metrics based on the Environment Agency's Wider Environmental Outcomes to reflect values for society and the environment (e.g. water quality, air quality);
- customers' preferences for service improvements and wider amenity values resulting from the investment solution;
- GHG emissions through the UK Government's cost of carbon;
- risks (e.g. reduced accidents, customer complaints); and,
- health and safety.

Whole life cost

5.4.8 We calculate the whole life cost of an investment solution by adding the whole life capital expenditure and the whole life ongoing operating costs. Capital expenditure includes capital overheads but excludes the effect of taxation. Whole life cost has been calculated on a consistent basis to the approach taken for PR24 investment appraisal. The present value of capital expenditure has been converted to a stream of annual costs over a 30-year appraisal period. To calculate the present value of these costs, and associated operating costs, the Social Time Preference Rate was used for discounting, consistent with the HM Treasury Green Book. Costs are in 2022/23 price base, using the CPIH financial year average.

Cost-Benefit Ratio

5.4.9 The cost benefit ratio is calculated by dividing whole life value by whole life cost.

Quantification of benefits

5.4.10 The primary values associated with borehole remedials are in retaining yield from the borehole and in protecting the groundwater from any future risk of [✂]. The benefits associated with the planned borehole investment programme are set out below.

5.4.11 **Security of supply/headroom risk**: Cleaning and renewing some of our boreholes will improve headroom eroded through their gradual degradation. Experience shows that boreholes can lose up to 30% of their yield over time and this can be reversed through cleaning or renewal. In addition, improvements to borehole headworks will prevent them being taken out of service, and therefore there will be less outage and impacts on our headroom. This means we will be able to maximise the yield from existing assets to support future growth. Whilst this may not fully offset the requirements to accommodate the growth it is a secondary benefit of this investment.

5.4.12 The impact of cleaning and relining on future yield recovery has been assessed as a potential degradation of 30% of the usual yield. The most appropriate recent example is the cleaning of a bore supporting [✂]where yield had dropped from 3Ml/d to 2.1Ml/d. For those bores where cleaning has been identified as an option the maximum yield for each of these bores has been multiplied by this proportion (30%) to develop a future value for the cleaning interventions.

5.4.13 **Health and Safety risk**: By replacing old and obsolete headworks structures with modern surface level structures we plan to remove or reduce the need for confined space training on many of our ground water sites and reduce the associated health and safety risks.

5.4.14 **Water quality compliance**: Improvements to borehole headworks and linings will prevent them being taken out of service, and therefore there will be less outage and impacts on our headroom. We have related the risk of aquifer contamination to the presence of bacteriological or pesticide samples in borehole raw water. Those boreholes where the headworks condition is most at risk of infiltration have been assessed. For bores where there has been some evidence of contamination the probability of a sample failure has been assessed as approximately 7%. [✂]

5.4.15 The value assessments presented in Table 8 below indicate that all of the preferred options are cost beneficial, apart from the redrilling of borehole 1 at [✂]. This is due to the high cost of remediating the existing borehole as part of the secure abandonment of the asset. This particular borehole has a wide and complex adit system which will require extensive backfill, however, this work would be essential as part of redrilling a new asset.

Table 8: Summary of whole life cost benefit assessment for the preferred options (£m, 2022-23 CPIH prices)

Site	Asset reference	Capex Cost	Cost Benefit Ratio
[✂]	[✂]	0.24	1.7
[✂]	[✂]	0.24	1.7
[✂]	[✂]	0.14	59.7
[✂]	[✂]	1.74	2.9
[✂]	[✂]	0.24	1.6
[✂]	[✂]	0.24	1.6
[✂]	[✂]	0.17	20.4
[✂]	[✂]	1.77	1.9
[✂]	[✂]	0.22	1.8
[✂]	[✂]	0.22	1.8
[✂]	[✂]	0.33	9.1

Site	Asset reference	Capex Cost	Cost Benefit Ratio
[✂]	[✂]	0.33	5.4
[✂]	[✂]	0.24	1.7
[✂]	[✂]	0.24	1.6
[✂]	[✂]	0.31	7.0
[✂]	[✂]	0.22	1.7
[✂]	[✂]	0.27	1.5
[✂]	[✂]	0.27	1.5
[✂]	[✂]	0.24	1.6
[✂]	[✂]	0.24	1.6
[✂]	[✂]	0.22	1.7
[✂]	[✂]	0.22	1.7
[✂]	[✂]	3.31	0.7
[✂]	[✂]	1.74	2.1

Source: UUW analysis

5.5 Customer and stakeholder views

5.5.1 It is vital we engage with customers and stakeholders across the entire region about their water and wastewater services. We have undertaken an iterative research approach to understanding customers' views on Asset Health. For this submission, we therefore reviewed recent and relevant research from our established body of customer research, including key projects which informed the PR24 business plan. Building on this existing knowledge base, we then undertook targeted bespoke research using both qualitative and quantitative methods. We have taken steps to ensure our customer research approach is proportionate and comprehensive, with the quantitative survey elements using a robust sample allowing for sub group analysis, and qualitative research using members of our existing research community.

5.5.2 Further information on the methodology, Independent Challenge Group engagement and the application of our insights can be found in the appendix *UUW26-26 Customer Research Approach – Regional Growth and Asset Health.*

5.5.3 The research programme shows strong customer support for intergenerational equity and a clear expectation that UUW invests proactively to address major long-term challenges. Customers consistently prioritise safety, service reliability and regulatory compliance as core outcomes. In particular, the findings indicate that:

- Customers expect investment decisions to be fair, future-focused and environmentally responsible.
- There is strong support for approaches that avoid transferring costs and risks to future generations. Customers want UUW to take early, responsible action on long-term risks, ensuring that expenditure is targeted at what matters most and delivers value for money. The Asset Health proposals have been developed in direct response to these expectations.
- Customers support increased investment to protect drinking water quality. They want UUW to stay ahead of high-impact, long-term risks, while retaining the flexibility to respond quickly to emerging issues and emergencies. The proposed investment reflects this balance and acknowledges customer sensitivity to bill impacts.

5.5.4 We have proactively sought the views of key statutory and customer stakeholders, in line with our programme wide engagement plan. This has ensured that our proposals are grounded in customer expectations and aligned with regulatory priorities. Engagement to date includes:

5.5.5 **YourVoice** – the Independent Challenge Group for the North West. We presented our findings from the recent customer research and welcomed input. The panel was broadly supportive of our plans.

5.5.6 **The Drinking Water Inspectorate (DWI)** – we have held an initial discussion with the DWI to explain our intent to submit cases for additional asset health investment for the three water asset classes and agreed an approach to providing further information for these. On 31 March we submitted three approach documents setting out our proposals to improve asset health in boreholes, rapid gravity filters and treated water storage facilities. We received a Final Decision Letter – Commend for support on 30 April 2026 a copy of which can be found in *UUW26-25 Letters of support*.

5.5.7 The Environment Agency – we held a meeting with the Environment Agency on 17 March to explain our intentions to submit asset health investment cases across a range of water and wastewater assets. We followed this up with a letter setting out our proposals and high-level indications around cost. We received a response on 25 March explaining that the Environment Agency will be working jointly with Ofwat to assess the proposals where those proposals are relevant to the Environment Agency. Due to the collaborative model of business case assessment, the Environment Agency will not provide additional supporting comments ahead of the submission deadline.

6. Robust and efficient costs

This section explains how we have developed our costs and the build-up of our estimates. It also provides evidence that our proposals are efficient, and summarises the results of the benchmarking against third party comparable costs.

6.1 How we developed our costs

6.1.1 This section explains how we developed our cost estimates for borehole interventions. We give a general overview of our methodology then we show a breakdown of costs at a project and programmatic level.

An overview of our methodology

6.1.2 This section sets out our methodology for calculating direct and indirect costs.

6.1.3 Direct costs are those that can be clearly and directly attributed to a specific asset, activity, or scheme. They arise solely because of the works being undertaken and would not be incurred otherwise. Direct costs are typically site-specific and measurable, and include construction labour, plant and equipment, materials, and disposal costs directly associated with delivering the works on site.

6.1.4 We assess direct costs using a bottom-up approach. This involves developing an engineering scope for each element of the work. We then develop a granular view of cost of each element of scope. To do this, we considered what we would need to do to deliver each element of scope. For example, if the engineering scope indicated we need to demolish existing infrastructure, we would need to use a bulldozer, remove the demolished material etc. In some cases, we had to make assumptions on what would be involved in each element of scope. We have detailed these in paragraph 6.4.2.

6.1.5 Each of these elements was then priced using a database containing costs from a range of different companies. This ensures that our estimates are in line with industry standards. Finally, we added an element of optimism bias to reflect best estimating practice, which varied depending upon whether we had a robust understanding of the asset. This produced our estimate of direct costs. We provide an example of this process in Section 6.4.

6.1.6 Indirect costs are those that enable, support, and govern the delivery of direct activities, but which cannot be practically or proportionately allocated to a single asset or activity. These costs are required to ensure that works are properly planned, managed, assured, and delivered safely and compliantly, and are typically incurred across multiple activities, projects, or sites rather than at an individual asset level.

6.1.7 Indirect costs include, for example:

- project and programme management;
- design management and technical assurance;
- health, safety and environmental management;
- planning, supervision and coordination activities;
- temporary works design and oversight; and,
- the corporate and operational support functions required to enable delivery.

6.1.8 Indirect costs are therefore not discretionary overheads, but a necessary and integral part of delivering capital works in a regulated, safety-critical environment. Excluding these costs would understate the efficient cost of delivery and would not reflect how capital programmes are practically delivered in the water sector.

6.1.9 Our calculation of indirect costs are aligned with best estimating practice. We include a risk allocation, which is informed by the extent to which historic schemes have been impacted by cost changes. We also include for our cost to serve, which reflects the costs UUW incurs managing and integrating the project. Finally, we include our corporate overhead, which enables us to recover our functional support costs.

6.1.10 We then subjected our cost estimates to third party benchmarking, which is set out in Section 6.2.

Programme-level cost build

6.1.11 This section provides more detail on the breakdown of direct and indirect costs. We have allocated optimism bias to direct costs. This is because we would expect optimism bias to reduce and direct costs to increase as schemes mature and move into delivery. Where applicable, we allocate contractor indirect costs to indirect costs.

6.1.12 Table 9 shows the split between direct and indirect costs by project. This shows that our indirect cost allocation is low compared to what could typically be expected - that the ratio of direct to indirect costs to be roughly equal. This is because we have challenged ourselves with a lean indirect cost allocation for this programme of work. This reflects the fact we will aim to absorb a high proportion of the programme into our existing cost base.

Table 9: Split of direct and indirect capital expenditure by project (£, 2022-23 CPIH)

Project	Direct	Indirect	Total
[✂]	188,894	55,711	**244,604**
[✂]	188,894	55,711	**244,604**
[✂]	105,915	31,238	**137,153**
[✂]	1,347,514	397,424	**1,744,938**
[✂]	188,894	55,711	**244,604**
[✂]	188,894	55,711	**244,604**
[✂]	134,401	39,639	**174,040**
[✂]	1,363,086	402,016	**1,765,103**
[✂]	173,322	51,118	**224,440**
[✂]	173,322	51,118	**224,440**
[✂]	256,977	75,791	**332,768**
[✂]	256,977	75,791	**332,768**
[✂]	188,894	55,711	**244,604**
[✂]	188,894	55,711	**244,604**
[✂]	241,405	71,198	**312,603**
[✂]	173,322	51,118	**224,440**
[✂]	204,707	60,375	**265,082**
[✂]	204,707	60,375	**265,082**
[✂]	188,894	55,711	**244,604**
[✂]	188,894	55,711	**244,604**
[✂]	173,322	51,118	**224,440**
[✂]	173,322	51,118	**224,440**
[✂]	2,556,168	753,893	**3,310,062**
[✂]	1,347,514	397,424	**1,744,938**
Total	**10,397,133**	**3,066,437**	**13,463,570**

Source: UUW estimates

6.1.13 Table 10 shows the programme-level breakdown of costs across the different indirect cost categories as described in paragraph 6.1.9.

Table 10: Programme-level cost build (£, 2022-23 CPIH)

[✂]

Source: UUW estimating

6.2 Our costs are efficient

6.2.1 This section presents evidence of cost efficiency. First we demonstrate that our costs are in line with those expected by independent third parties.

Our costs are considered efficient by Turner and Townsend

6.2.2 We engaged Turner and Townsend to provide third party benchmarking. This involved comparing our cost estimates against the costs similar organisations incur when carrying out the activity. We provide an excerpt from Turner and Townsend's report below, which sets out the methodology used as part of the benchmarking analysis.

"Our team have utilised our extensive industry data and Water Sector Benchmarking Club to undertake a comprehensive benchmarking exercise for UU across several programmes of work covering Boreholes, RGFs, Service Reservoir, Filters, Settlement Tanks, Aeration Tanks and Growth projects for New Homes. Our Water Sector Benchmarking Club compiles external cost data through our platform, the Hive. This leverages anonymised data from six water sector organisations, creating the largest dataset of its kind within the sector. The Water Sector Benchmarking Club has been utilised in this benchmarking exercise, alongside our internal industry data.

We carried out a comprehensive review of the cost build-up of the projects provided by UU.

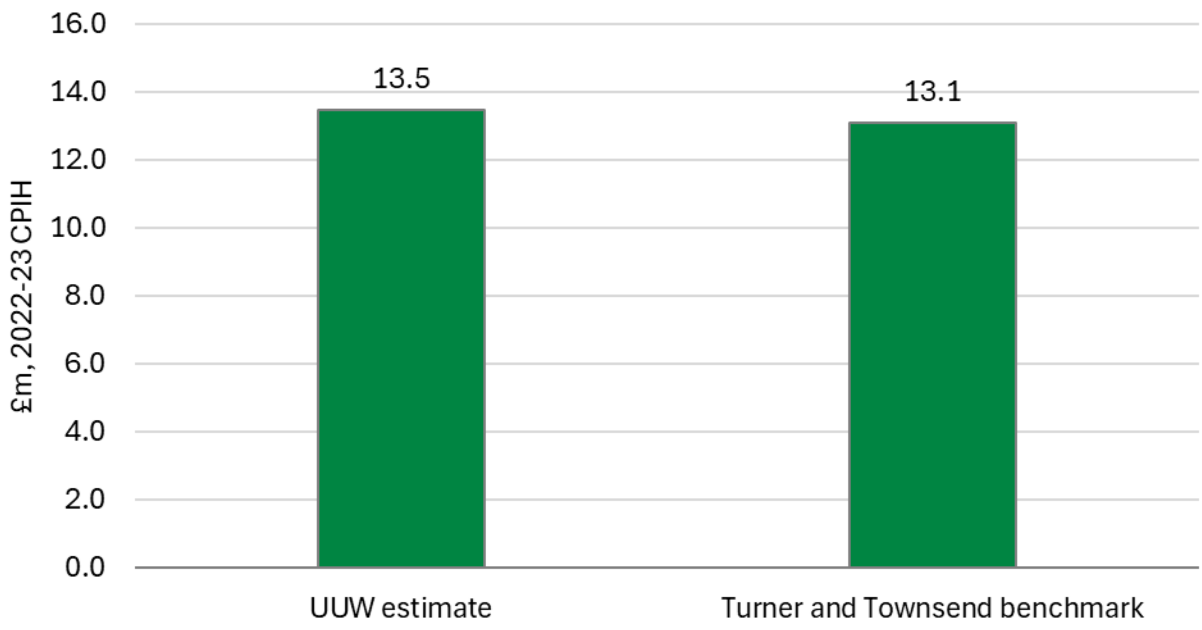
We benchmarked the direct costs at component level, in accordance with UU's work breakdown structure, where possible. We have also benchmarked the uplifts for the following on-costs (Indirect costs, Project overheads, Risk and Estimating uncertainty) ***finding these were in line with industry expectations****.*

Our conclusion is that the methodology for developing the Capex estimate prepared by United Utilities is robust, and that the performance and cost profiles of UUs proposed interventions are consistent with the expected range observed across comparable projects delivered by industry peers*.[17]"*

6.2.3 Figure 16 illustrates the results of Turner and Townsend's benchmarking for our borehole programme. This demonstrates that our cost estimates are efficient and well aligned with those expected by third parties.

[17] Turner and Townsend. *Asset health and growth benchmarking report.*

Figure 16: Turner and Townsend confirms costs aligned with industry benchmarks (2022-23 CPIH)



Source: *UUW estimates and Turner and Townsend*

6.2.4 We provide a full overview of our benchmarking approach and associated reports in *UUW26-28 Benchmarking reports.*

6.3 We do not consider Ofwat's workload and expenditure data to be a robust source for cost benchmarking

6.3.1 We understand that Ofwat may wish to use its workload and expenditure data to compare companies' intervention costs to identify an efficient benchmark. However, we would caution against any reliance on this dataset as a source of company comparisons.

6.3.2 This section sets out evidence that demonstrates the data is not sufficiently granular to provide a meaningful indication of relative efficiency. In summary, this is because it reflects an average cost of multiple different intervention types carried out across the sector. A company that carries out a greater proportion of cheaper intervention types will appear artificially efficient – whereas – in reality - the lower observed unit cost is merely reflecting a simpler programme of work, often with shorter life interventions. If applied inappropriately, this dataset could distort incentives and discourage companies from selecting lowest whole-life-cost solutions aligned with good asset management practice.

6.3.3 We have set out the key issues in relation to the dataset and its unsuitability for robust cost efficiency assessments under the following headings:

- Lack of granularity;
- Inconsistent categorisation;
- Inherent variability in the data; and,
- Distortion of incentives.

Lack of granularity

6.3.4 The data is split into four categories, 'repair', 'refurbishment', 'replacement' and 'other' types of intervention. There is significant variation captured within each expenditure category, as refurbishment or replacement activities can differ materially in scope and complexity. As a result, higher unit costs may simply indicate that a company is undertaking more intrusive or costly interventions that can result in a longer asset life rather than implying a lower level of efficiency.

6.3.5 If unit costs are used at the refurbishment and replacement level, as captured by Ofwat, then genuine differences in company intervention mix will not be apparent and risk being wrongly characterised as differences in underlying efficiency.

6.3.6 This approach to unit costs would reward companies that engage in a high proportion of relatively lower cost refurbishment and replacement interventions. In contrast, companies will be disincentivised to invest in a high proportion of more expensive refurbishment interventions as the assessed efficient unit cost will be unachievable for these solutions. Furthermore, this incentive structure would contradict a key aim of the Asset Health Roadmap, that companies should use allowances to "maintain the long-term capability of assets".[18] This would require proactive and long-lasting interventions.

6.3.7 For example, as seen in Table 11, [✂]Water likely has relatively more small-scale refurbishments. We would expect that this would reduce its unit costs for reasons not solely linked to differences in efficiency.

Table 11: Total refurbishment expenditure and number of interventions for each company (2015/16-2024/25)[19]

Company	Expenditure (£m) (2015/16 – 2024/25)	Number of Interventions (2015/16 – 2024/25)	Average Unit Cost (Expenditure / Interventions £m)	Number of Boreholes	Intervention Rate per Borehole
ANH	12.26	766	0.02	522	1.47
TMS	12.76	166	0.08	324	0.51
WSX	9.66	165	0.06	154	1.07
UUW	36.60	96	0.38	149	0.64
SEW	7.19	89	0.08	249	0.36
AFW	4.55	86	0.05	232	0.37
NES	2.25	39	0.06	66	0.59
SSC	0.48	28	0.02	132	0.21
SVE	54.51	25	2.18	225	0.11
SWB	0.32	25	0.01	97	0.26
SRN	9.06	14	0.65	157	0.09
YKY	1.50	6	0.25	115	0.05
BRL	0.01	3	0.00	25	0.12
WSH	0.13	2	0.06	35	0.06
PRT	0.00	2	0.00	41	0.05
SES	0.04	2	0.02	82	0.02
HDD	0.00	0		5	0.00

Source: UUW analysis of Ofwat (2026) Sector workload and expenditure dataset v2 – for circulation.

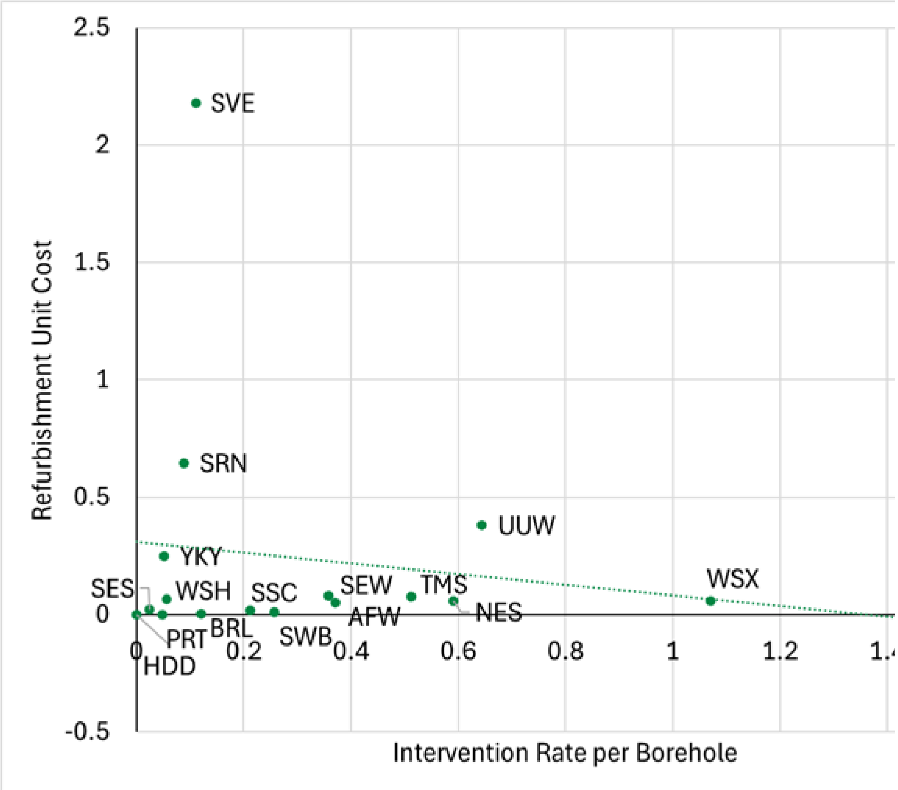
6.3.8 This is further supported by the negative correlation between refurbishment unit cost and the intervention rate per borehole, which indicates that there is a contrast between companies that engage

[18] Ofwat (2024). Roadmap for enhancing asset health understanding in the water sector. Available at: PR24-final-determinations-Roadmap-for-enhancing-asset-health-understanding-in-the-water-sector.pdf.

[19] Ofwat (2026). Sector workload and expenditure dataset v2 – for circulation.

in a large number of small-scale interventions and those that prioritise fewer, more costly, interventions. This is illustrated in Figure 17.

Figure 17: Diagram showing the negative correlation between number of refurbishments per borehole and the overall refurbishment unit cost[20]



Source: UUW analysis of Ofwat (2026) Sector workload and expenditure dataset v2 – for circulation

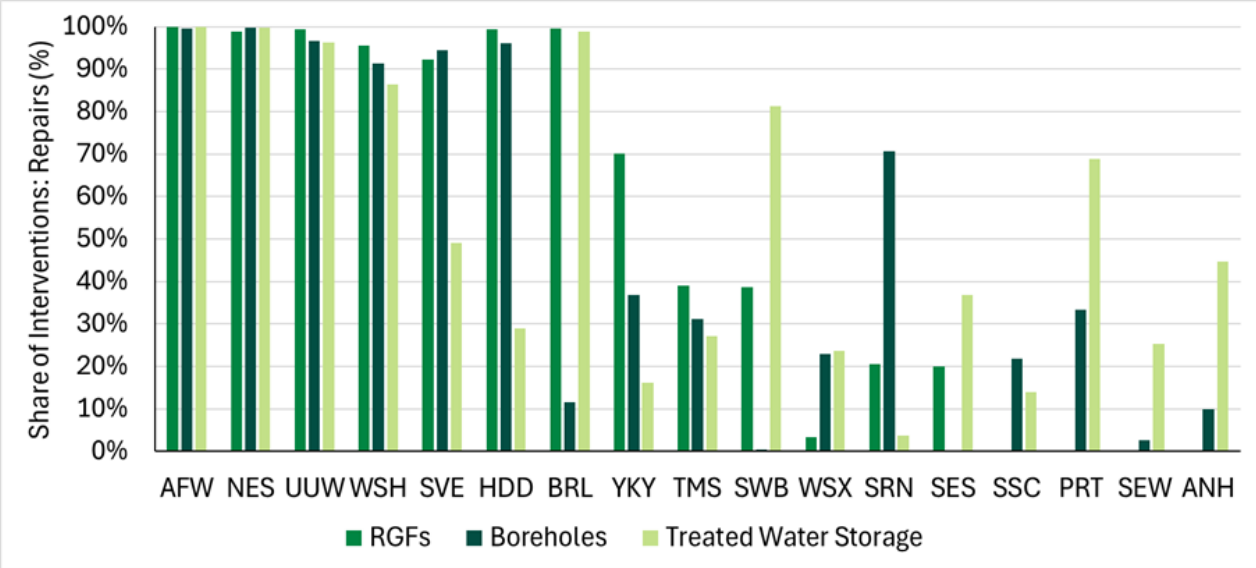
Inconsistent Categorisation

6.3.9 There is not necessarily a clear distinction between repairs and refurbishments, which may lead to some companies having the same cheaper intervention categorised as a 'repair' where others categorise it as a 'refurbishment'. This will distort any unit cost comparisons.

6.3.10 Figure 18 and Figure 19 show that companies with a higher proportion of repairs typically have a low proportion of refurbishments. Without a more granular breakdown of the data, it is not possible to ascertain whether this stems from a preference for proactive over reactive maintenance, or simply inconsistency in classification of repairs and refurbishments.

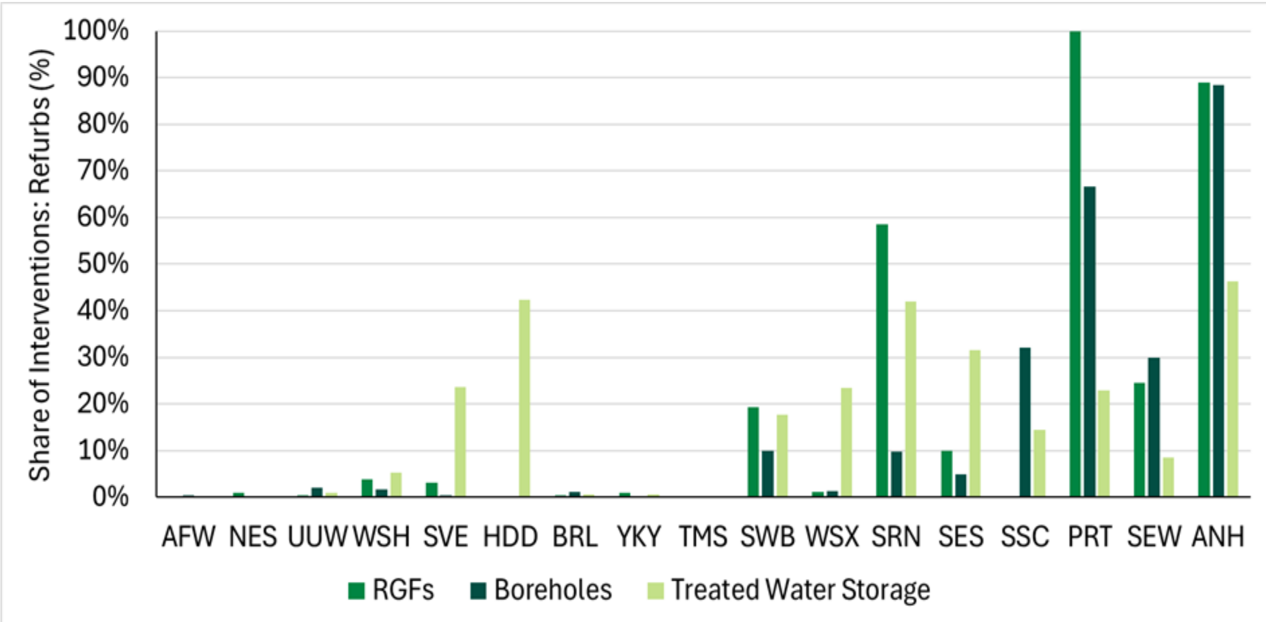
[20] Ofwat (2026). Sector workload and expenditure dataset v2 – for circulation.

Figure 18: Proportion of water asset class interventions categorised as 'repair'



Source: UUW analysis of Ofwat (2026) Sector workload and expenditure dataset v2 – for circulation

Figure 19: Proportion of water asset class interventions categorised as 'refurbishment'

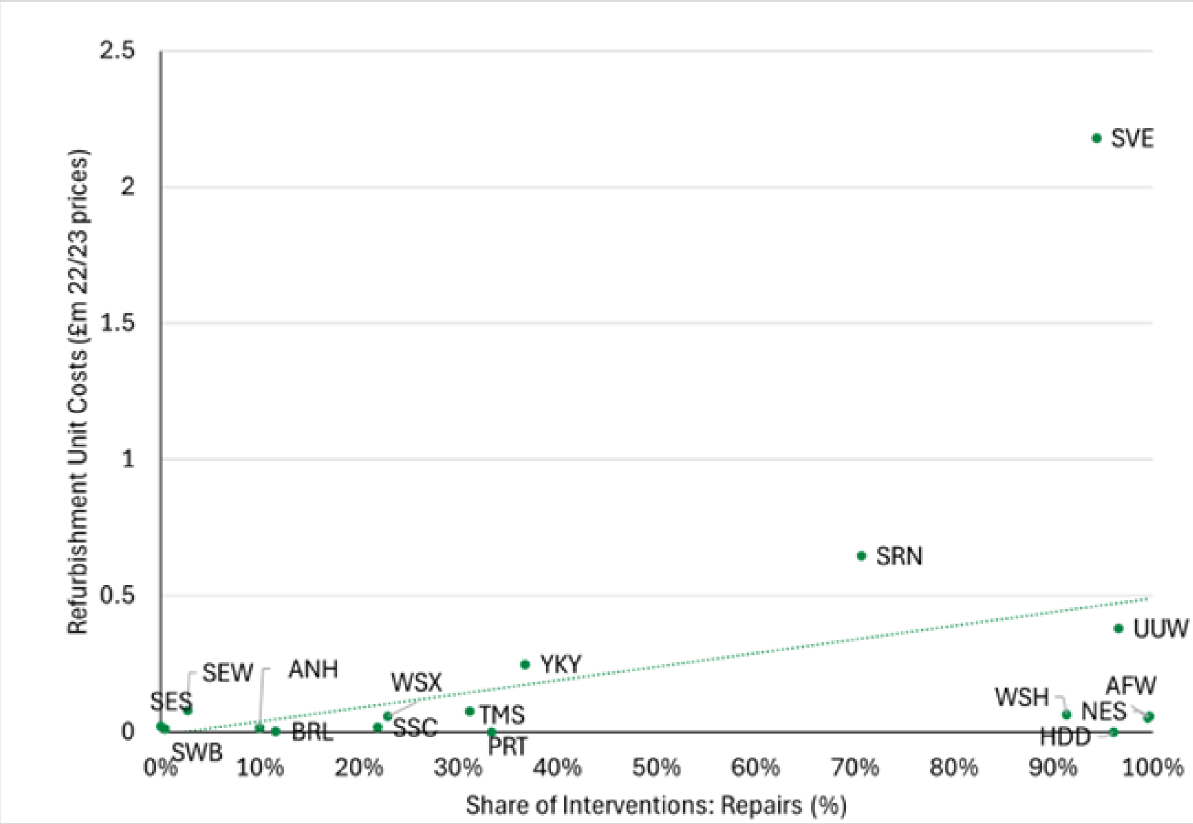


Source: UUW analysis of Ofwat (2026) Sector workload and expenditure dataset v2 – for circulation.

6.3.11 Potential misclassification is also evidenced by the fact that companies with a low proportion of repairs are more likely to have a low refurbishment unit cost, which suggests that certain repairs could be miscategorised as refurbishments. This is illustrated by some companies, such as Anglian Water, that have a low borehole refurbishment unit cost, a low proportion of repairs and a large number of refurbishment interventions per asset.

6.3.12 Figure 20 below illustrates the industry-wide correlation between a low refurbishment unit cost and a low proportion of repair interventions.

Figure 20: Diagram showing the positive correlation between proportion of interventions classified as 'repairs' and refurbishment unit costs[21]



Source: UUW analysis of Ofwat (2026) Sector workload and expenditure dataset v2 – for circulation

6.3.13 The relationship between the proportion of repair interventions and refurbishment unit costs presented in Figure 20 above may help to explain the negative correlation observed in Figure 17, between the refurbishment unit cost and the volume of refurbishment interventions. Specifically, where a relatively high proportion of lower-cost repair activities are delivered alongside, or instead of, more expensive refurbishments, this can influence the reported average refurbishment unit cost across the industry.

6.3.14 If there was no allocation bias between repairs and refurbishments, and assuming a consistent industry case-mix of refurbishment activities, we would expect unit cost to remain stable and a broadly flat line of best fit. We would expect expenditure to increase linearly with the number of interventions, and unit cost would remain stable over time.

Inherent variability in the data

6.3.15 Figure 21 illustrates the replacement unit costs[22] over time for boreholes across the industry. It highlights the variability inherent in the recorded data and the challenges this presents for interpreting unit cost differences. The volatility in unit cost over time is so large that it is unlikely to be solely as a result of (in)efficiency differences. For example, the mean and median show significant volatility throughout the period, which is not directly attributable to expected year-on-year variation.

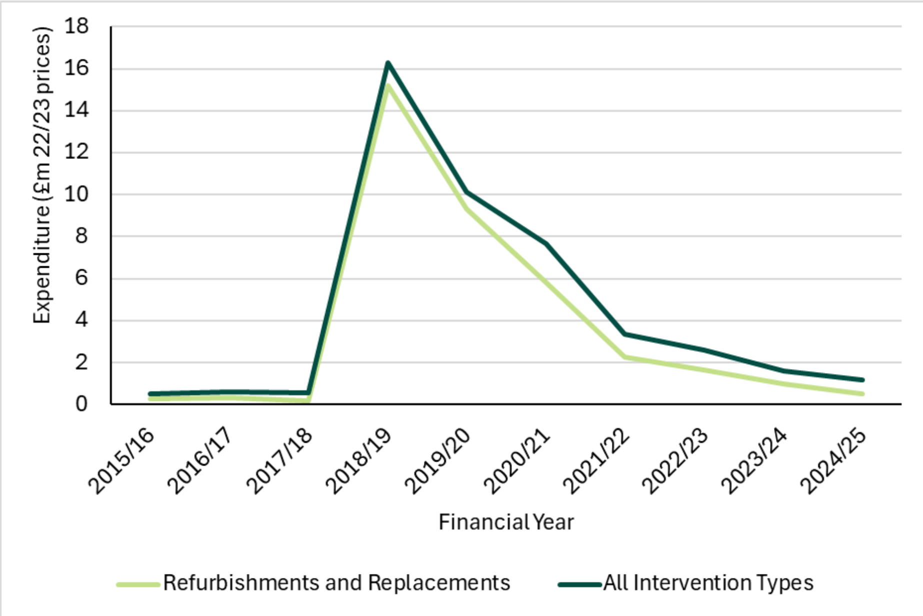
6.3.16 If the scope of activities undertaken were comparable between companies and over time, we would expect the unit cost to remain stable throughout the period. Instead, it indicates that there are material differences in the scope of activities undertaken inherent in the historic data, not reflected by a simple unit cost assessment. This presents challenges for interpreting a forward-looking unit cost allowance

[21] Ofwat (2026) Sector workload and expenditure dataset v2 – for circulation.

[22] Calculated as the total expenditure on replacements divided by the quantity of replacements.

opposite company plans. This further supports our position that there are a number of different types of replacement activity that cannot be assessed under a single broad category.

Figure 21: Replacement Unit Costs over Time: Boreholes[23]



Source: UUW analysis of Ofwat (2026) Sector workload and expenditure dataset v2 – for circulation.

A simple unit cost approach would create distortive incentives

6.3.17 A simple unit-cost approach to assessing cost efficiency could materially distortive incentives for a company asset strategy. If companies are judged against a single refurbishment, or replacement-level unit cost, the regulatory framework would implicitly reward those who choose the lowest short-term capital expenditure option—regardless of whether it delivers the best whole-life outcome. Under such an approach, companies are likely to prioritise low-cost interventions to remain “efficient” in comparative assessments, even where a more substantial, longer-lasting intervention would provide better value for customers over the asset’s life and deliver greater improvements in environmental and operational resilience.

6.3.18 This risk is illustrated by our recommendations to replace headworks at several sites in order to reduce the likelihood of future outages. While deferring replacement represents a lower AMP8 capital solution in the short term, it materially increases the risk of future service failures due to eroded operational headroom. A unit-cost-based efficiency framework could therefore discourage prudent, forward-looking investment of this nature, to the detriment of the best option for customers.

6.3.19 This incentive structure would contradict a key aim of the Asset Health Roadmap, that companies should use allowances to “maintain the long-term capability of assets”[24] and for this reason, it should not be implemented.

6.3.20 It is vital we engage with customers and stakeholders across the entire region about their water and wastewater services. We have undertaken an iterative research approach to understanding customers’ views on Asset Health. For this submission, we therefore have:

- Reviewed recent and relevant research from our established body of customer research, including key projects which informed the PR24 business plan.
- Undertaken targeted bespoke research using both qualitative and quantitative methods.

[23] Ofwat (2026). Sector workload and expenditure dataset v2 – for circulation.

[24] Ofwat (2024). Roadmap for enhancing asset health understanding in the water sector. Available at: PR24-final-determinations-Roadmap-for-enhancing-asset-health-understanding-in-the-water-sector.pdf.

- Ensured our customer research approach is proportionate and comprehensive, with the quantitative survey elements using a robust sample allowing for sub group analysis, and qualitative research using members of our existing research community.

6.4 An example cost breakdown

6.4.1 We now provide a full worked example for the [✂]borehole cleaning project. This gives a practical example to demonstrate the methodology we set out in Section 6.1.

Estimating assumptions

6.4.2 We used the following assumptions when estimating the costs for all borehole interventions.

- We have not made an allowance for on-site delays.
- A generic site set-up has been assumed.
- Cranage is assumed to be required at all sites for pump removal and re-installation.
- Activities are based on a borehole depth of 200 m and a diameter of 500 mm.
- Above-ground headworks are assumed to be located within buildings, requiring modification works to enable crane access.
- Below-ground chambers are assumed to require a 3.5 m casing extension and backfilling using clean limestone.
- CCTV and geophysical surveys are required both prior to and following cleaning works to assess any impact.
- Geophysical surveys and chemical cleaning activities are assumed to be subcontracted.
- An allowance has been included for three technicians per day (8 hours per day) to complete the majority of site works, together with 4 hours per day of supervision by an experienced drilling practitioner.
- New pumps are assumed to be required for boreholes that are currently out of service.
- Sampling and installation monitoring have not been included for re-drilling works.
- Pump testing and CCTV and geophysical surveys are assumed to be undertaken as part of the re-drilling works.
- The requirement for abstraction licence and discharge consent applications has not been included for pumping tests.
- No new rising mains are assumed to be required for re-drilled boreholes.
- No new observation boreholes are assumed to be required for re-drilled boreholes.
- Where multiple activities are recommended at a single site, duplication of enabling works has been avoided through a cost reduction of £2,000.
- All sites are assumed to be readily accessible using standard equipment, with no requirement for traffic management.
- Costs have been derived from the [✂]Framework.
- [✂]are expressed at a March 2026 price base.

How we developed our direct costs

6.4.3 Table 12 below sets out our engineering scope and associated cost estimate for a borehole cleaning project. This provides Ofwat with an example of how our costs have been constructed.

6.4.4 A borehole cleaning project has two distinct elements. One relates to the cleaning itself while the other relates to standard costs that are incurred on an active site. We scoped and estimated each separately. This is clearly shown in Table 12. The total reconciles back to the direct cost for [✄]set out in Table 9.

Table 12: Borehole estimate for [✄] (£, 2022-23 CPIH)

Scope item	Unit	Unit rate	Unit quantity	Total cost
Borehole clean				
[✄]	[ ]	[✄]	-]	[✄]
[✄]	[ ]	[✄]	-]	[✄]
[✄]	[ ]	[✄]	-]	[✄]
[✄]	[ ]	[✄]	-]	[✄]
[✄]	[ ]	[✄]	-]	[✄]
[✄]	[ ]	[✄]	-]	[✄]
[✄]	[ ]	[✄]	-]	[✄]
[✄]	[ ]	[✄]	-]	[✄]
[✄]	[ ]	[✄]	-]	[✄]
[✄]	[ ]	[✄]	-]	[✄]
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[✄]	[ ]	[✄]	-]	[✄]
[✄]	[ ]	[✄]	-]	[✄]
[✄]	[ ]	[✄]	-]	[✄]
[✄]	[ ]	[✄]	-]	[✄]
[✄]	[ ]	[✄]	-]	[✄]
[✄]				

Source: UUW analysis

6.4.5 We then add on appropriate indirect costs to this to calculate a total project cost. This is shown in Table 13. The total reconciles back to the project value for[✄]set out in Table 9.

Table 13: How we calculated total costs for [✂] (£, 2022-23 CPIH)

Cost category	Value
-]	[✂]
-]	[✂]
-]	[✂]
-]	[✂]
-]	**[✂]**

Source: UUW estimates

6.5 How we have accounted for repair costs associated with the proposal

6.5.1 Typically, civils assets have relatively infrequent, but more substantial investment than mechanical, electrical and instrumentation assets. They are more often refurbished or replaced than they are repaired: this is reflected in the historic cost splits for repairs, with civils often accounting for less than 3% of repair expenditure.

6.5.2 We therefore expect to realise only modest savings in repair costs across the Boreholes asset class during AMP8 because of the asset health cost change expenditure. This is because:

- Our investment proposal covers only a small proportion of the installed asset base within the Boreholes asset class i.e. around 16% of our stock (24 of 148 operational bores)
- The delivery investment is profiled in the last few years of the AMP.
- It impacts predominantly civil assets which account for a relatively small proportion of repair costs. Repair work on boreholes has historically been approximately 97% on mechanical, electrical, instrumentation and control and automation (MEICA) assets, with around 3% associated with civil and structural elements.

6.5.3 Whilst the proposed investment on Boreholes will help to extend the life of these assets and reduce the risk of incidents and failures, it will have only minor impact upon in-AMP repair costs across the asset class.

Historical repair expenditure and implicit allowance

6.5.4 It is important to note that Ofwat has not set asset class specific allowances but rather an overall base expenditure allowance across the entirety of the asset base. Therefore, assessing ex-post WBB for a subset of asset classes requires applying key methodological assumptions and extensive judgement. While we have complied with Ofwat's guidance for the Cost Change process, we believe that adopting a mechanistic approach to estimating WBB has its limitations and that such an approach should not set a precedent for wider application at PR29.

6.5.5 We have used a similar WBB approach to assess an implied level of allowance for repairs for four of the five asset classes in our cost change submission (excluding gravity sewers). This assessment indicates that we have historically invested in a higher level of repair than is implicitly funded. The repair WBB assessment and average historical expenditure for boreholes is set out in Table 14.

Table 14: Historical repair expenditure compared with implied WBB allowance for boreholes

	Boreholes (£m/AMP) FY2022/23
WBB assessment - repair	£3.1
UUW's average AMP repair expenditure AMP6-7	£3.3

Source: UUW analysis

6.5.6 We have quantified an estimated range of implied savings associated with the proposed investment as **£4k to £129k** for AMP8. These potential savings would only be relevant to AMP8 as they would be associated with avoiding repair work on the assets in scope as they would instead be receiving capital investment during the AMP.

6.5.7 Our approach involved the following steps, as illustrated in Table 15:

- **Step 1a -** Calculate a WBB allowance for repair by extending our existing WBB calculation to include repair expenditure alongside replacement and refurbishment costs (for detail please see *UUW26 – 18 Asset Health – What base buys methodology*);
- **Step 1b -** Subtract from the total WBB that include repair costs (as calculated in step 1a) the WBB covering only refurbishment and replacement costs;
- **Step 2 -** Scale the repair only WBB allowance calculated in Step 1b based on the subset of assets in scope for the cost change investment;
- **Step 3 -** Adjust the potential savings based on the delivery profile of our investment (this assumes that each year's delivery programme on average delivers mid-year, so the year 3 programme has potential for savings across the last 2.5 years of the AMP);
- **Step 4 -** Assess the low end of the range by adjusting the potential savings by the proportion of civils only.

Table 15: Calculation of indicative repair cost savings associated with the AMP8 boreholes investment

Step	Description	Interim Calculation
1	**Calculate WBB repair**	
	WBB implied repair allowance per AMP	£3,090k
2	**Scale WBB for assets in scope**	
	Proportion of asset base included in cost change	16%
	WBB repair for assets in scope	£494k
3	**Calculate potential WBB savings based on investment profile (20%,40%,40%)**	
	20% x 2.5 years + 40% x 1.5 years + 40% x 0.5 years	26%
	Whole AMP implied saving (£494k x 26%)	£129k
4	**Calculate the proportion of potential civils repair savings**	
	Historic civils proportion of repair	3%
	Whole AMP implied civil saving (£129k x 3%)	£4k

Source: UUW analysis

6.5.8 We have therefore included £129k as potential opex savings associated with avoided repairs in AMP8. This represents the high end of the plausible range.

7. Customer Protection

This section sets out strong safeguards to ensure customers only fund efficiently delivered work. We propose output-based PCDs for our incremental investment and an expenditure-based PCD for our existing AMP8 programme. Our proposals ensure that customers are protected from double-funding through transparent separation of base and incremental investment.

7.1 Price Control Deliverables (PCDs)

Borehole cost change PCD

7.1.1 We are proposing PCDs based upon efficient delivery of intervention types for this programme. For the cost change claim on the borehole priority class this involves an output-based PCD with five sets of rates, one for each deliverable. Any non-delivery of outputs would be subject to the clawback mechanism as set out in [✄]16.

7.1.2 [✄]16 presents the breakdown of intervention types used to set the output-based PCD deliverables and associated non-delivery rates. The rates are derived at programme level and reconcile directly to the total net cost allowance proposed as part of this proposal, reflecting the value of the scheme rather than individual interventions.

7.1.3 PCD Unit rates have been calculated by dividing the total capex forecast for each intervention type by the total number of interventions within that category. [✄]16 sets out the intervention mix, volumes, and resulting unit rates, whilst demonstrating the reconciliation back to the total net cost proposed as part of this proposal.

[✄]16: [✄]

Intervention type	Number in AH Investment Proposal plan	Cost driver	Unit rate model for PCD (FY2022/23 cost base) £	Total cost £	Worked example provided
[✄]	15	No.	240,613	3,609,198	Example A
[✄]	2	No.	156,020	312,039	
[✄]	3	No.	1,751,660	5,254,979	
[✄]	1	No.	3,310,062	3,310,062	
[✄]	3	No.	326,046	978,138	
				13,464,416	

Source: UUW analysis

PCD reporting, assurance and other conditions

7.1.4 This section provides further details underpinning our approach to this proposed PCD. This includes parameters such as the measurement, reporting and assurance of the PCD, any timing incentives proposed and any additional conditions of the PCD mechanism on the proposed allowance.

7.1.5 This is an output-based PCD mechanism which applies to the investment proposal expenditure. This would be above and beyond our base programme expenditure.

7.1.6 The base programme would be assured as part of the APR process to confirm base capex each year against each priority class.

7.1.7 The APR assurance for Asset Health would confirm there has been no overlap between the base programme and the additional Asset Health expenditure.

7.1.8 Any changes to the list of sites / interventions arising from new information as set out in the agreed Asset Health cost change would be presented alongside the APR PCD data ahead of the coming year. Commentary would provide a clear explanation for the change(s) and demonstrate how it would not increase risk to customers.

7.1.9 The overall programme value would not exceed the cost adjustment allowance although, with agreement, the mix of interventions could be varied.

7.1.10 PCD outputs, progress and expenditure would be reported each year as part of our standard Delivery Plan reporting arrangements applied to all existing PCDs. Overall delivery against this PCD will be assessed at the end of year five AMP8 (i.e. 2029/30). If we have spent at least 60% of the allowed expenditure for this PCD due in AMP8, then there would be no claw back provided that the remaining delivery takes place by the end of AMP9 (i.e. 2034/35). This is in line with Ofwat's current PCD guidance (February 2026).

7.1.11 The delivery of the interventions is not anticipated to have any impact on existing PR24 FD PCDs. We therefore do not propose any adjustment to the existing FD PCDs.

7.1.12 Ofwat's PR24 FD sets out where timing incentives apply. These are restricted to water supply, supply and resilience interconnectors, metering, phosphorus removal, storm overflows and mains renewals. These incentives are designed to promote timely delivery of benefits. With the exception of mains renewals, these areas use scheme level PCDs that allow greater flexibility in deliverables, therefore reducing the financial risk created by the application of timing incentives. In contrast, the PCDs proposed in this submission case have tightly defined, granular outputs, limiting the ability to substitute deliverables. For this reason, we do not propose applying timing incentives, except in the scenario of post-AMP8 delivery.

Worked Example of the proposed PCD

7.1.13 The worked example below explains how we propose clawback would be calculated in the event of non-delivery for one of the output types shown in [✂]16.

Table 17: Example: New headworks

Intervention required "New headworks" on a single bore	
Number of bores	= 1
Fixed rate per bore "a"	= £240,613
PCD assessment	= 1 x (a)
	= 1 x (240,613)
PCD Potential clawback	= **£240,613**

Base expenditure PCD

7.1.14 In addition to the output based PCD for this cost change submission, we also propose an expenditure-based PCD to protect customers from non-delivery and claw back unspent allowances for WBB across four asset classes (see Table 18). We propose a single expenditure-based PCD that would operate across four of our asset classes. If the expenditure in one asset class is less that our implicit funding allowance, but it is offset by a higher expenditure in one of the other asset classes, there would be no PCD clawback. This would provide sufficient flexibility to ensure that companies remain incentivised to target their maintenance interventions efficiently whilst providing appropriate customer protection.

7.1.15 This type of expenditure-based PCD is similar to PCDs included in PR24 final determinations. These include Network Reinforcement and Climate Change Uplift PCDs, both of which have separate expenditure-based outputs for the Water and Wastewater services respectively. The additional granularity of reporting at Water and Wastewater price control levels provides additional customer protection. Overall we consider the approach would offer appropriate customer protection and claw back allowed costs in the event of non-delivery of the planned outputs.

Limitations of WBB

7.1.16 In our calculation of WBB, we have highlighted the limitations of any mechanistic approach used to assess WBB for individual asset classes and the data issues associated with the assessment. In applying any methodology, we believe that Ofwat should give significant consideration to the risk of an overstatement and the potential impacts this could have on restricting companies' base expenditure decisions in a way that would be inconsistent with the PR24 approach to base expenditure allowances.

7.1.17 We therefore believe that our WBB estimates very much represents the upper end of the range that should be considered for WBB and that, in view of the risks associated with over-estimation, Ofwat should consider whether lower limits should be binding on companies. We have therefore proposed potential mitigations that Ofwat could consider in the *UUW26-18 Asset Health – What Base Buys* document.

Detail of PCD breakdown

7.1.18 In our AMP8 programme across the priority asset classes, we have allocated base funding to cover proactive investment on boreholes following our planned inspection programme. This expenditure on proactive interventions will be ringfenced through a base expenditure PCD in line with the aggregate WBB figure of up to £77m across the asset classes.

7.1.19 Table 18 summarises the breakdown of WBB across the relevant asset classes in our submission (excluding Gravity Sewers, because it is not an expenditure based PCD). We propose that our base expenditure PCD should be ringfenced at the aggregate level. This approach ensures delivery of up to £77m of base investment, whilst allowing us to optimise prioritisation of intervention across assets in response to emerging risks.

7.1.20 This ensures that the cost-change claim is incremental to our existing AMP8 capital maintenance plan. Our expenditure on refurbishments and replacements was £18m on average per AMP across FY2015/16-FY2024/25, therefore we are confident that we will spend our implicit allowance of £6.4m for boreholes.

Table 18: WBB PCD breakdown (£m, 2022-23 CPIH prices)

Asset class	WBB
Boreholes	6.4
Rapid Gravity Filters	8.5
Water Network storage assets	55.7
Trickling filters	6.5
Total	**77.1**

Source: UUW analysis

7.2 Impact on Performance Commitments

7.2.1 The delivery of the interventions is not anticipated to provide measurable in-period performance improvement, as the programme is targeting risk reduction, not short-term performance uplift. The investment will strengthen resilience and reduce risks to security of supply, water quality and safe operation. However, these benefits mainly arise through avoided failures rather than improvements that are directly visible in AMP8 performance commitments, such as the Compliance Risk Index and Customer Contacts about Water Quality PCs. The effect is gradual, with risk mitigations already in place to prevent in-period performance impact. As such, we are not expecting to see any secondary benefit associated with this investment against the AMP8 performance commitments.

8. Investment Delivery Plan

Delivery will be through the AMP8 Build-Only delivery runway, supported by specialist borehole framework suppliers. Programme sequencing is driven by outage planning, operational constraints and seasonal access. The supply chain has confirmed capacity to deliver all interventions within AMP8. We are actively managing risks such as site access, outage availability, and dry-weather constraints through defined mitigations, including early access planning, flexible scheduling, and multi-contractor mobilisation. Our investment profile rises sharply from 2027-2028 to 2029-30 in line with system outage windows and supply-chain readiness.

8.1 Supply chain readiness

8.1.1 Our strategy is to deliver the projects in this case via the most appropriate delivery "runway" under our AMP8 runway-based delivery model. More detail of the runway-based delivery model has been set out in our PR24 business plan submission, and summarised in Section 7 of *UUW26-02: Growth Unlocked: Water for the New Economy.*

8.1.2 Assessment of supply chain capacity and deliverability risk should not be considered in the context of any one case in isolation. Instead we have considered the impact of all cases with our Growth and Asset Health submissions in aggregate on the baseline AMP8 programme. We have undertaken a thorough programmatic assessment of capacity in our new AMP8 supply chain, to ensure that the overall investment proposal is deliverable, and that there is sufficient headroom in capacity and availability of resource within our design consultants and construction supply chain, in addition to our internal programme management capacity, to accommodate the additional investment.

8.1.3 Please refer to Section 7 of *UUW26-02: Growth Unlocked: Water for the New Economy* for the programmatic assessment which considers all projects proposed for investment across all cases within our Growth and Asset Health submissions, with the supporting evidence that all such investments are deliverable.

8.2 Delivery risk: design/delivery risks tracked with mitigations

8.2.1 Key delivery risks have been identified, including access constraints at rural or remote sites. Mitigation measures are in place, such as early site access planning, use of specialist off-road equipment where required, and flexible scheduling to avoid seasonal access restrictions. Additional mitigations include multi-supplier frameworks to reduce dependency on single contractors and contingency allowances within the delivery plan.

8.2.2 Based on the evidence of need, the maturity of the delivery plan, and the confirmed capability and capacity of the supply chain, the programme is considered fully deliverable within AMP8.

8.2.3 A programme risk register has been developed for Asset Health (see *UUW26-27: Deliverability risk register*). Some of the key risks associated with borehole delivery are shown in Table 19 below.

Table 19: Key delivery risks

Risk Description	Risk Type	Mitigation Details and Progress	Risk Impact Score Maximum 25
Access to remote / rural sites There is a risk that some sites may be restricted due to terrain, landowner or seasonal constraints.	Threat	• Early access planning • Landowner liaison • Use of specialist off-road equipment • Flexible scheduling and sequencing of the works.	15
Production capacity impact There is a risk that demand may restrict the ability to carry out the required refurbishments	Threat	• The programme has been reviewed against outage requirements. • The programme will be planned and scheduled inline with operations to avoid peak periods	15
Water Programme There is a risk that dry weather impacts may reduce the window for outages	Threat	• The programme has been developed to limit this impact	15
Availability of supply chain (Build) to deliver the additional scope in AMP8 Risk that there is insufficient capacity to deliver the additional scope causing delays to delivery and/or increased costs for accelerated delivery	Threat	• Early visibility of the Growth & Asset Health programmes will be provided to our delivery partners - this work will help to bridge the ramp up to AMP9 Transitional Investment and AMP9 and avoid critical resources being redeployed to other water programmes or other growth industries. • Where there is overlap between Growth and Asset Health with the AMP8 programme the works will be amalgamated to reduce rework	6

Source: UUW26-27 Deliverability risk register

8.3 Outline delivery schedule

8.3.1 The successful delivery of the Borehole Refurbishment Programme requires a capable and resilient supply chain with expertise in borehole refurbishment, pump maintenance, and mechanical, instrumentation and electrical (MEICA) upgrades. The necessary framework agreements with specialist contractors are in place providing the capability and capacity deliver the programme at scale throughout AMP8. An example of the steps required for borehole refurbishment can be found below in Figure 22.

Figure 22: Example of a typical borehole cleaning plan

Activity	Total	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
Prep site and mobilise	1																																						
Fit temp sealed head plate over he BH	1																																						
Remove Kiosk	1																																						
Mobilisation of drilling rig & set-up	2																																						
Carry out Pre-CCTV	1																																						
Remove dip tubes	2																																						
Install pump equipment	1																																						
Pump test	1																																						
Calibration testing and Step Testing inc CCTV	3																																						
Remove test pump equipment	1																																						
Borehole Cleaning	5																																						
Removal of material from Borehole base	3																																						
Install pump equipment	1																																						
Carry out clearance pumping	2																																						
Calibration testing and Step Testing inc CCTV	3																																						
Remove test pump equipment	1																																						
Carry out CCTV and geophysical logging of the Borehole	1																																						
Remove Drilling Rig	2																																						
Remove all equipment	2																																						
Return to serve and sampling	3																																						
Demobilise from site	1																																						
Total days	**38**																																						

Source: UUW analysis

8.3.2 A diverse number of sites have been assessed, each with varying levels of deterioration and intervention needs. These requirements have been incorporated into a structured delivery programme informed by detailed site investigations, condition assessments, and operational performance data. As part of programme development, we have undertaken a formal assessment of supply chain capacity and engaged framework partners to confirm resource availability, mobilisation readiness, and delivery sequencing.

8.3.3 A robust and deliverable programme has been established through detailed site assessments, ensuring that the proposed refurbishment works can be undertaken without compromising production capacity or service continuity.

8.3.4 The interventions required at each site differ and this has been account for deliverability assessments. Each site has been evaluated to confirm that operational resilience can be maintained throughout the works and that sufficient supply chain capability exists to support timely delivery. The programme sequencing and delivery strategy have been developed directly from the outcomes of this assessment, providing a plan for completion.

8.3.5 To strengthen confidence in deliverability, the sites have been assessed against defined constructability and delivery criteria. These criteria set out the required delivery runway, identify any enabling works, and clarify the expectations placed on contractors. This structured approach ensures that each site enters delivery with a clear understanding of constraints, risks, and resource requirements.

8.3.6 A review has also been undertaken to identify interfaces with AMP8 investment programmes. This has ensured alignment with wider capital delivery commitments and avoided potential conflicts in access, resourcing, or outage planning. As a result, the proposed programme integrates well with the broader AMP8 portfolio, reducing the risk of delay.

8.3.7 To carry out the refurbishment or replacement some assets must be taken offline during the construction period and therefore an operational impact assessment is to be completed for each site.

8.3.8 Through this structured assessment process, clear delivery criteria, and alignment with AMP8 programmes, the proposed works are demonstrated to be both deliverable and operationally resilient. The programme provides strong assurance that the required asset health improvements can be achieved.

8.4 AMP8 delivery evidence

8.4.1 UUW remains broadly on track to deliver against its PR24 Final Determination (FD) Performance Commitment Deliverables (PCDs). As explained in *UUW26-02 Growth Unlocked: Water for the New Economy* we are delivering against the requirements of the FD PCDs whilst spending in line with UUW's AMP8 enhancement allowances in the final determination.

8.4.2 The mains renewals base PCD in the PR24 Final Determination is of most relevance to this submission case as it helps monitor improvements in the asset health during AMP8 by imposing a PCD on set outputs. Our performance illustrates how we are successfully delivering against our current FD PCD commitments. In the FD, Ofwat expects the sector to move towards a sustainable mains replacement rate to maintain and improve asset health during the period. It therefore set a PCD on all companies to deliver the specified output of the PCD (a company specific length of mains). In the May 2026 Delivery Plan progress update we are reporting delivery against this PCD as Green, showing that we are on track with delivering the requirements of this base investment to Ofwat's FD requirements.

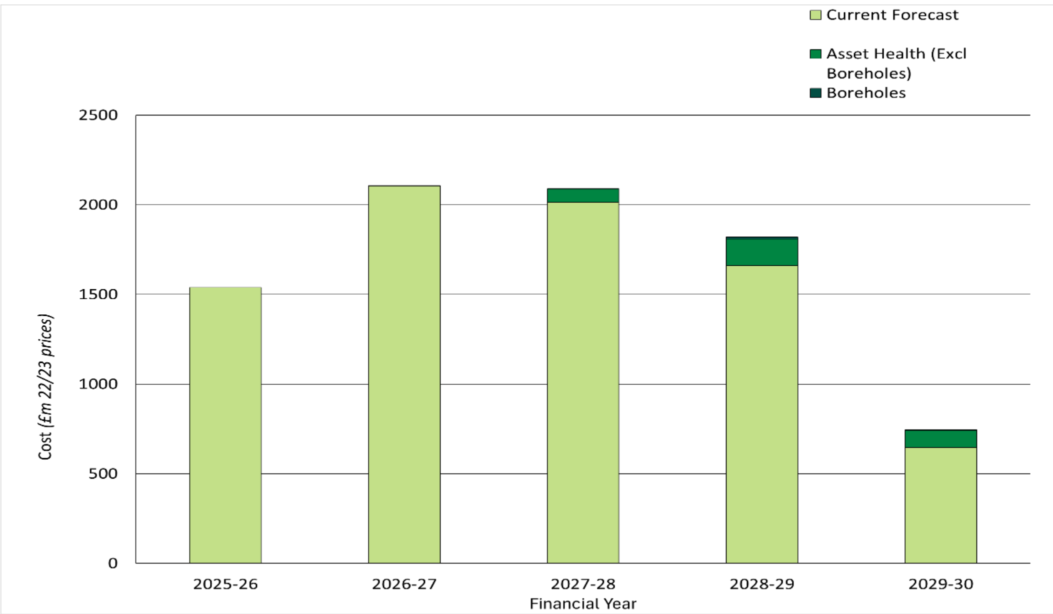
8.4.3 [✂] 20 and the following graph (Figure 23) illustrates the investment for asset health in the context of the Asset Health submission and the existing AMP8 programme. We are confident that the full programme is deliverable. The successful delivery of the Borehole Refurbishment Programme requires a capable and resilient supply chain with expertise in borehole refurbishment, pump maintenance, and mechanical, instrumentation and electrical (MEICA) upgrades. The necessary framework agreements with specialist contractors are in place providing the capability and capacity deliver the programme at scale throughout AMP8. Letters of support from key organisations within our supply chain can be found in *UUW26-25 Letters of support*.

[✂] 20: [✂]

Cost Change Category	FY2025/26	FY2026/27	FY2027/28	FY2028/29	FY2029/30	Total
[✂]	0.0	1.28	75.20	148.42	96.62	321.52
[✂]	0.0	0.0	0.66	9.92	2.88	13.46

Source: UUW analysis

Figure 23: Investment profile for Boreholes against AMP8 (22/23 Price Base)



Source: UUW analysis

8.5 Stakeholder engagement and permissions

8.5.1 Each year, UUW delivers a wide-ranging programme of infrastructure investment, spending around £800 million annually across its asset base, based on average capital expenditure over the past three financial years. Most of this work, including the borehole activities set out in this proposal, takes place within our site boundaries and has minimal impact on customers or local stakeholders. Where communities may be affected, for example by increased traffic movements associated with deliveries, we proactively manage impacts by streamlining traffic routes, using screening to reduce visual and noise disruption, and offering community drop-in sessions for nearby residents. These measures ensure stakeholders are well informed, supported, and able to raise concerns at an early stage.

9. Assurance

The submission meets Ofwat's requirements for third-party assurance, with independent review of technical scope, cost robustness and customer protection mechanisms. This provides strong confidence that the programme is justified, efficient, deliverable, and aligned with PR24 asset health expectations.

9.1.1 This section summarises UUW's approach to assuring this submission and the outcomes of the third-party assurance. It is supported by *UUW26-19 Asset Health assurance report.*

9.1.2 Ofwat requires cost changes submissions to include a third-party assurance report in line with the requirements set out in "*PR24 final determinations: Expenditure allowances - assurance requirements for delivery of enhancement schemes appendix*"[25]. This includes technical and commercial assurance across the content of the submission.

9.1.3 The Technical Assurance confirms that the proposed investment meets the requirements set out in Ofwat's guidance for the following areas:

- Need for a step change in investment;
- Best option for customers; and,
- Investment delivery plan.

9.1.4 The Commercial Assurance provides a view on the robustness of the costs proposed by the company and whether they are efficient and represent industry best practice, this includes an assessment of cost estimation approach.

9.1.5 The Commercial assurance also confirms that the proposed investment meets the requirements set out in this document for the following areas:

- Robust and efficient costs; and,
- Customer protection.

[25] PR24-final-determinations-Expenditure-allowances-Assurance-requirements-for-delivery-of-enhancement-schemes-appendix.pdf

10. Site Specific Cases – Section Removed

Appendix A Site selection methodology

Table 21: Site list by exclusion criteria

Site	Option	Is there an asset health risk	Is the asset critical?	Is the asset still required?	Is there an alternative investment stream (growth or quality)?	Is a short life intervention viable?	Is there a cost effective, longer life intervention?	Is an integrated solution viable with another driver?	Is the need for the asset expected to outlast the proposed asset life?	Do the existing structural assets have significant asset life
[✂]	[✂]	Yes	Yes	Yes	No	No	No	No	Yes	Yes
[✂]	[✂]	Yes	Yes	Yes	No	No	No	No	Yes	Yes
[✂]	[✂]	No								
[✂]	[✂]	No								
[✂]	[✂]	Yes	No							
[✂]	[✂]	No								
[✂]	[✂]	Yes	No							
[✂]	[✂]	Yes	No							
[✂]	[✂]	Yes	Yes	Yes	No	No	No	No	Yes	Yes
[✂]	[✂]	Yes	No							
[✂]	[✂]	Yes	Yes	Yes	No	No	No	No	Yes	No
[✂]	[✂]	Yes	Yes	Yes	No	No	Yes			
[✂]	[✂]	Yes	Yes	Yes	No	No	Yes			
[✂]	[✂]	Yes	Yes	Yes	No	No	No	No	Yes	Yes
[✂]	[✂]	Yes	Yes	Yes	No	No	No	No	Yes	Yes
[✂]	[✂]	No								
[✂]	[✂]	No								
[✂]	[✂]	No								
[✂]	[✂]	No								
[✂]	[✂]	Yes	Yes	Yes	No	Yes				
[✂]	[✂]	Yes	Yes	Yes	No	Yes				

Site	Option	Is there an asset health risk	Is the asset critical?	Is the asset still required?	Is there an alternative investment stream (growth or quality)?	Is a short life intervention viable?	Is there a cost effective, longer life intervention?	Is an integrated solution viable with another driver?	Is the need for the asset expected to outlast the proposed asset life?	Do the existing structural assets have significant asset life
[✄]	[✄]	Yes	Yes	Yes	No	Yes				
[✄]	[✄]	Yes	Yes	Yes	No	Yes				
[✄]	[✄]	Yes	Yes	Yes	No	Yes				
[✄]	[✄]	Yes	Yes	Yes	No	Yes				
[✄]	[✄]	No								
[✄]	[✄]	No								
[✄]	[✄]	No								
[✄]	[✄]									
[✄]	[✄]	Yes	Yes	Yes	No	Yes				
[✄]	[✄]	Yes	Yes	Yes	No	Yes				
[✄]	[✄]	No								
[✄]	[✄]	Yes	Yes	Yes	No	Yes				
[✄]	[✄]	Yes	Yes	Yes	No	Yes				
[✄]	[✄]	Yes	Yes	Yes	No	Yes				
[✄]	[✄]	No								
[✄]	[✄]	Yes	Yes	Yes	No	Yes				
[✄]	[✄]	No								
[✄]	[✄]	No								
[✄]	[✄]	No								
[✄]	[✄]	No								
[✄]	[✄]	No								
[✄]	[✄]	Yes	Yes	Yes	No	Yes				
[✄]	[✄]	No								
[✄]	[✄]	Yes	No							
[✄]	[✄]	Yes	No							

Site	Option	Is there an asset health risk	Is the asset critical?	Is the asset still required?	Is there an alternative investment stream (growth or quality)?	Is a short life intervention viable?	Is there a cost effective, longer life intervention?	Is an integrated solution viable with another driver?	Is the need for the asset expected to outlast the proposed asset life?	Do the existing structural assets have significant asset life
[✂]	[✂]	Yes	Yes	Yes	No	No	No	No	Yes	Yes
[✂]	[✂]	Yes	Yes	Yes	No	No	No	No	Yes	No
[✂]	[✂]	No								
[✂]	[✂]	No								
[✂]	[✂]	Yes	Yes	Yes	No	Yes				
[✂]	[✂]	No								
[✂]	[✂]	No								
[✂]	[✂]	No								
[✂]	[✂]	No								
[✂]	[✂]	Yes	Yes	Yes	No	No	No	No	Yes	Yes
[✂]	[✂]	Yes	Yes	Yes	No	No	No	No	Yes	Yes
[✂]	[✂]	Yes	Yes	Yes	No	No	No	No	Yes	Yes
[✂]	[✂]	No								
[✂]	[✂]	No								
[✂]	[✂]	Yes	Yes	Yes	No	No	No	No	Yes	Yes
[✂]	[✂]	Yes	Yes	Yes	No	No	No	No	Yes	Yes
[✂]	[✂]	No								
[✂]	[✂]	No								
[✂]	[✂]	No								
[✂]	[✂]	No								
[✂]	[✂]	No								
[✂]	[✂]	No								
[✂]	[✂]	No								
[✂]	[✂]	Yes	Yes	Yes	No	Yes				
[✂]	[✂]	Yes	Yes	Yes	No	Yes				

Site	Option	Is there an asset health risk	Is the asset critical?	Is the asset still required?	Is there an alternative investment stream (growth or quality)?	Is a short life intervention viable?	Is there a cost effective, longer life intervention?	Is an integrated solution viable with another driver?	Is the need for the asset expected to outlast the proposed asset life?	Do the existing structural assets have significant asset life
[✂]	[✂]	Yes	Yes	Yes	No	Yes				
[✂]	[✂]	Yes	Yes	Yes	No	Yes				
[✂]	[✂]	Yes	Yes	Yes	No	Yes				
[✂]	[✂]	No								
[✂]	[✂]	No								
[✂]	[✂]	No								
[✂]	[✂]	Yes	Yes	Yes	No	Yes				
[✂]	[✂]	No								
[✂]	[✂]	No								
[✂]	[✂]	Yes	No							
[✂]	[✂]	Yes	No							
[✂]	[✂]	Yes	Yes	Yes	No	Yes				
[✂]	[✂]	No								
[✂]	[✂]									
[✂]	[✂]	Yes	Yes	Yes	No	No	No	No	Yes	Yes
[✂]	[✂]	Yes	Yes	Yes	No	No	No	No	Yes	Yes
[✂]	[✂]	Yes	Yes	Yes	No	No	No	No	Yes	Yes
[✂]	[✂]	Yes	Yes	Yes	No	No	No	No	Yes	Yes
[✂]	[✂]	Yes	Yes	Yes	No	No	No	No	Yes	Yes
[✂]	[✂]	Yes	Yes	Yes	No	No	No	No	Yes	Yes
[✂]	[✂]	Yes	Yes	Yes	No	Yes				
[✂]	[✂]	No								
[✂]	[✂]	No								
[✂]	[✂]	Yes	Yes	Yes	No	Yes				
[✂]	[✂]	Yes	Yes	Yes	Yes					

Site	Option	Is there an asset health risk	Is the asset critical?	Is the asset still required?	Is there an alternative investment stream (growth or quality)?	Is a short life intervention viable?	Is there a cost effective, longer life intervention?	Is an integrated solution viable with another driver?	Is the need for the asset expected to outlast the proposed asset life?	Do the existing structural assets have significant asset life
[✂]	[✂]	Yes	Yes	Yes	No	No	No	No	Yes	Yes
[✂]	[✂]	Yes	No							
[✂]	[✂]	Yes	No							
[✂]	[✂]	Yes	Yes	Yes	No	Yes				
[✂]	[✂]	Yes	Yes	Yes	No	Yes				
[✂]	[✂]	Yes	Yes	Yes	No	Yes				
[✂]	[✂]	Yes	No							
[✂]	[✂]	No								
[✂]	[✂]	Yes	Yes	Yes	No	Yes				
[✂]	[✂]	No								
[✂]	[✂]	Yes	Yes	Yes	No	Yes				
[✂]	[✂]	Yes	Yes	Yes	No	Yes				
[✂]	[✂]	Yes	Yes	Yes	No	Yes				
[✂]	[✂]	No								
[✂]	[✂]									
[✂]	[✂]	No								
[✂]	[✂]	Yes	Yes	Yes	No	Yes				
[✂]	[✂]									
[✂]	[✂]									
[✂]	[✂]	No								
[✂]	[✂]	No								
[✂]	[✂]	Yes	Yes	Yes	No	No	No	No	Yes	Yes
[✂]	[✂]	No								
[✂]	[✂]	No								
[✂]	[✂]	No								

Site	Option	Is there an asset health risk	Is the asset critical?	Is the asset still required?	Is there an alternative investment stream (growth or quality)?	Is a short life intervention viable?	Is there a cost effective, longer life intervention?	Is an integrated solution viable with another driver?	Is the need for the asset expected to outlast the proposed asset life?	Do the existing structural assets have significant asset life
[✄]	[✄]	No								
[✄]	[✄]	Yes	No							
[✄]	[✄]	Yes	No							
[✄]	[✄]	Yes	Yes	Yes	No	Yes				
[✄]	[✄]	Yes	Yes	Yes	No	Yes				
[✄]	[✄]									
[✄]	[✄]									
[✄]	[✄]									
[✄]	[✄]	No								
[✄]	[✄]	Yes	Yes	Yes	No	Yes				
[✄]	[✄]	No	Yes	Yes	No	Yes				
[✄]	[✄]	Yes	Yes	Yes	No	Yes				
[✄]	[✄]	No								
[✄]	[✄]	No								
[✄]	[✄]	No								
[✄]	[✄]	No								
[✄]	[✄]	No								
[✄]	[✄]	Yes	Yes	Yes	No	No	No	No	Yes	Yes
[✄]	[✄]	No								
[✄]	[✄]	Yes	Yes	Yes	Yes					
[✄]	[✄]	No								
[✄]	[✄]	No								
[✄]	[✄]	Yes	Yes	Yes	No	No	No	No	Yes	No
[✄]	[✄]	Yes	Yes	Yes	No	No	No	No	Yes	No
[✄]	[✄]	No								

Site	Option	Is there an asset health risk	Is the asset critical?	Is the asset still required?	Is there an alternative investment stream (growth or quality)?	Is a short life intervention viable?	Is there a cost effective, longer life intervention?	Is an integrated solution viable with another driver?	Is the need for the asset expected to outlast the proposed asset life?	Do the existing structural assets have significant asset life
[✂]	[✂]	No								
[✂]	[✂]	No								
[✂]	[✂]	Yes	No							

Appendix B Borehole sites and planned interventions

Table 22: Borehole sites and planned interventions

Site ID	Site name	Headworks renew	Repair / Redrill	Borehole Cleaning
[✂]	[✂]	2	0	0
[✂]	[✂]	0	0	1
[✂]	[✂]	0	1	0
[✂]	[✂]	2	0	0
[✂]	[✂]	0	1	1
[✂]	[✂]	1	0	0
[✂]	[✂]	2	0	1
[✂]	[✂]	2	0	1
[✂]	[ ]	2	0	1
[✂]	[✂]	1	0	0
[✂]	[✂]	2	0	0
[✂]	[✂]	1	0	0
[✂]	[✂]	1	0	0
[✂]	[✂]	1	0	0
[✂]	[✂]	1	0	0
[✂]	[✂]	0	1	0
[✂]	[✂]	0	1	0
Totals		**18**	**4**	**5**

Appendix C Base Asset Health Dashboard Risk Forecasting

C.1 Base Asset Health Dashboard

C.1.1 The Base Asset Health dashboard is a tool developed by UUW to support asset investment decision making. It provides a picture of the current and future asset health, and risk position of our asset base resulting from a defined investment programme.

C.1.2 The dashboard presents a view across our whole above ground asset inventory. Each asset has:

- a modelled replacement cost, based upon historic UUW's project costs.
- a nominal expected asset life based upon historic UUW norms for asset replacement ages.
- an effective age based on physical age but influenced by the most recent condition assessment.
- a criticality band, based upon the potential service impact associated with asset failure.

C.1.3 The model includes forecasts of asset health and risk for various investment scenarios for each five-year investment period for the next thirty years to 2055.

C.1.4 The dashboard displays three scenarios with the profile of asset value by life for the selected assets in that investment period. Assets move upwards as they age. Assets which have exceeded 85% of their life are identified as 'end of life'.

C.1.5 The three scenarios are:

- No investment. In this scenario the assets age and are not replaced or renewed.
- Planned investment. In this scenario the current planned level of capital maintenance for AMP8 is continued each AMP for the next 30 years, ring fenced to the relevant part of the asset base, such as "all water treatment works".
- Planned investment with cost change. In this scenario the current planned level of capital maintenance for AMP8 is supplemented, just for AMP8 with the refurbishment of the targeted assets included within the AMP8 cost change business cases. Subsequently investment returns to PR24 levels for the next 30 years, ring fenced as before.

C.1.6 For all three scenarios for each forecast period, the effective age of the asset base is increased by five years, i.e. accounting for the initial condition state. Assets that are predicted to be fully life expired are then selected for renewal based upon a risk measure; the most critical life expired assets are selected first, until the available capital maintenance programme budget is exhausted. Upon renewal assets are assumed to have an effective age of zero as they enter the next timestep.

C.1.7 In the third scenario "Planned investment with cost change" additional specific assets included within the investment cases are refurbished i.e. a tank, including media, instruments, scrapers, distributors, valving and pipework, plus any local control.

Risk forecasts

C.1.8 Assets typically carry significantly more risk of failure as they enter the last 15% of their lives. The forecast change in risk position is driven by the number, value, and criticality of assets that are predicted to be life expired. This assessment enables us to track whether a well targeted investment programme is sufficient to stabilise or improve the overall risk position of the asset base, or if is predicted to lead to an overall degradation in asset health related risk.

C.1.9 The following worked example indicates the risk forecast assessment methodology on four assets over two investment periods, showing scenarios with and without investment.

Table 23: Risk forecast assessment methodology on four assets over two investment periods (without investment)

Without investment

End of AMP	Asset	Effective age	Asset Life	Criticality	Replacement cost	BAH	Last 15% End of life	Criticality weight	End of life risk score
7	1	10	12	A	£1,000	83%	0	5	0
	2	60	60	B	£10,000	100%	1	4	40000
	3	30	35	C	£20,000	86%	1	3	60000
	4	25	23	D	£5,000	100%	1	2	10000
								End of AMP7 risk score	110000
								End of AMP7 normalised risk score	**1.00**
End of AMP	**Asset**	**Effective age**	**Asset Life**	**Criticality**	**Replacement cost**	**BAH**	**Last 15% End of life**	**Criticality weight**	**End of life risk score**
8	1	15	12	A	£1,000	100%	1	5	5000
	2	65	60	B	£10,000	100%	1	4	40000
	3	35	35	C	£20,000	100%	1	3	60000
	4	30	23	D	£5,000	100%	1	2	10000
								End of AMP8 risk score	115000
								End of AMP8 normalised risk score	**1.05**
End of AMP	**Asset**	**Effective age**	**Asset Life**	**Criticality**	**Replacement cost**	**BAH**	**Last 15% End of life**	**Criticality weight**	**End of life risk score**
9	1	20	12	A	£1,000	100%	1	5	5000
	2	70	60	B	£10,000	100%	1	4	40000
	3	40	35	C	£20,000	100%	1	3	60000
	4	35	23	D	£5,000	100%	1	2	10000
								End of AMP9 risk score	115000
								End of AMP9 normalised risk score	**1.05**

Source: UUW analysis

Table 24: Risk forecast assessment methodology on four assets over two investment periods (with investment)

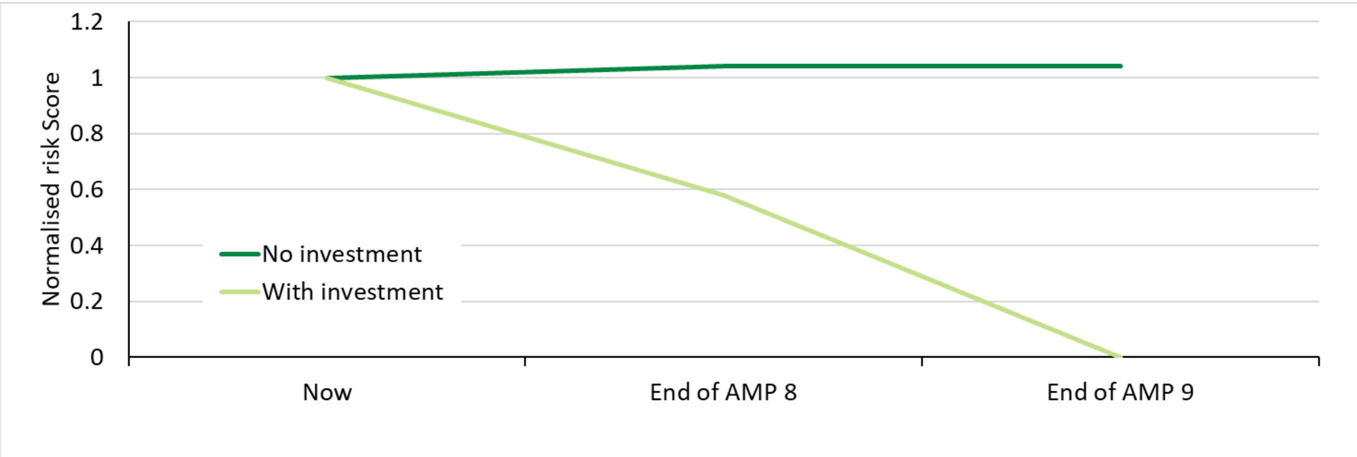
With investment (grey highlighting indicates investment)

End of AMP	Asset	Effective age	Asset Life	Criticality	Replacement cost	BAH	Last 15% End of life	Criticality weight	End of life risk score
8	1	15	12	A	£1,000	100%	1	5	5000
	2	0	60	B	£10,000	0%	0	4	0
	3	35	35	C	£20,000	100%	1	3	60000
	4	0	23	D	£5,000	0%	0	2	0
								End of AMP8 risk score	65000
								End of AMP8 normalised risk score	**0.59**
End of AMP	**Asset**	**Effective age**	**Asset Life**	**Criticality**	**Replacement cost**	**BAH**	**Last 15% End of life**	**Criticality weight**	**End of life risk score**
9	1	0	12	A	£1,000	0%	0	5	0
	2	5	60	B	£10,000	8%	0	4	0
	3	0	35	C	£20,000	0%	0	3	0
	4	5	23	D	£5,000	22%	0	2	0
								End of AMP9 risk score	0
								End of AMP9 normalised risk score	**0.00**

Source: UUW analysis

The above example (no investment) as described in Table 23 and the related example (with investment) as described in Table 24 would result in the following changes over time in underlying asset health risk across the portfolio of assets, as shown in Figure 24.

Figure 24: Risk change over time



Source: UUW analysis

United Utilities Water Limited
Haweswater House
Lingley Mere Business Park
Lingley Green Avenue
Great Sankey
Warrington
WA5 3LP

unitedutilities.com

United Utilities

Water for the North West