Southern Water
PR24 Redetermination
Statement of Case

21 March 2025

from Southern Water

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Annexes:

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Southern Water Statement of Case

Introduction to Southern Water

from Southern Water

Introduction to Southern Water

1. We set out in this chapter an introduction to Southern Water and why we need a CMA redetermination. We explain how our AMP8 investment programme is a generational environmental opportunity to transform our business to respond to insufficient security of supply of water in the south and public expectations for the environment. This context is essential to understanding why we have felt it necessary to request a referral of Ofwat's FD for redetermination by the CMA.

2. We then summarise what Southern Water does, the challenges facing the company and how these differ from those faced by other companies. We summarise Southern Water's recent history, including performance and reporting issues, critical refinancing and the launch of our turnaround plan.

3. This chapter should be read in conjunction with the technical statement of case which is focused on individual errors of analysis or judgement in specific Ofwat decisions. An executive summary of the statement of case provides an overview of the grounds of our appeal.

4. The chapter is structured as follows:

    1. Why we need a CMA redetermination.
    2. PR24 – a generational environmental opportunity;
    3. What Southern Water does and how Southern Water differs from other companies;
    4. Southern Water's recent history; and
    5. Refinancing and turnaround – the private sector solution.

1. Why we need a CMA redetermination

5. Southern Water has been through a challenging period. Over the last 2 years it has been on a Board and shareholder supported Turnaround, and is facing generational investment requirements against a history of regulatory underfunding. Our 2025–30 Business Plan proposes investment of more than £8.5 billion over five years to improve services and it also includes £3.3 billion of environmental projects.

6. This will see us limit our impact on local rivers by reducing the amount of water we take from them, build new long-term water sources, like reservoirs and water recycling plants, and upgrade our wastewater treatment sites so they are more reliable and can better support future population growth and improve water quality in 1,000km of our rivers. At the same time, we plan to significantly reduce storm overflows at almost 300 locations along our coastline. This is the time for all stakeholders to support our plan, to succeed in the interests of customers and our environment and deliver the critical investment, infrastructure and growth across our region.

7. Our statement of case sets out essential changes that are required to the FD to support the sheer size and complexity of investment needed to run the business sustainably, to meet our legal obligations and our customers' ambitions. We provide evidence to inform the redetermination process to ensure decisions set a fair balance between funding, allowances, and operational targets to ensure we avoid the curtailment of vital investment over the next five years. It is not in the interests of our customers or our environment for Southern Water's Refinancing and

Turnaround to fail. We ask the CMA to implement the remedies outlined in our seven areas of dispute and to act in support of our Turnaround. We specifically draw attention to:

- Overall risk imbalance and financeability: The balance of risk and return is critical for us to deliver value for customers in AMP8 because we need to attract a significant amount of capital to deliver unprecedented levels of investments, meet ever increasing performance targets and protect the environment. AMP8 represents a step change in the level of risk that we face. New regulatory requirements, the unique ecological characteristics of our region, climate change, population growth and significant degree of stretch in our performance commitments all contribute to a material increase in risk. An assessment of risk and return and the impact on financeability is a critical step in concluding whether companies are likely to succeed in delivering a regulatory determination.

  Our AMP8 programme is, in many ways, more stretching and has more requirements than those of other companies in the sector due to the unique characteristics of our region and because it imposes materially more risk on us than in AMP7.

- Botex funding allowances: Botex funding allowances, set to fund the costs needed to deliver the base level of routine service and asset maintenance, continue with a regulatory approach that has resulted in significant underfunding using models, post modelling adjustments and cost adjustment claims that fail to account for company specific circumstances. Allowances for capital maintenance are included within the overall base cost allowance without any adjustment to account for the actual health of our asset base. This has led to systemic under-funding for the last 20 years, meaning we have had to invest £585m above our base allowance of £3.6bn in our wholesale water asset base to meet our statutory capital maintenance requirements. This is unsustainable.

  The resulting level of the funding shortfall for AMP8 is approximately £650m – a material amount, equivalent to around 18% of Ofwat's allowed base funding for all water, wastewater and bioresources services.

- Enhancement funding allowances: Enhancements are improvements to assets and services to meet new standards or statutory requirements as well as activities to provide services to new customers. There is a step change in enhancement investment required for AMP8. The FD cost allowance for the PR24 enhancement programme is over five times the allowance for the PR19 (AMP7) enhancement programme. Most enhancement projects are driven by environmental statutory and regulatory requirements. Despite providing fully costed project assessments, in many instances, abbreviated or arbitrary assessments have been applied resulting in significant unjustified funding shortfalls without any substantive engagement with or rebuttal of the evidence provided.

  The resulting level of the funding shortfall for AMP8 is approximately £300m – a material amount, equivalent to 8% of Ofwat's allowed enhancement funding for all water, wastewater and bioresources services.

- Uncertainty mechanisms: AMP8 involves a step change in investment, including many schemes with limited track record for delivery in the UK water sector. In many cases, new requirements were confirmed after the submission of our business plan, with further updates being provided to Ofwat throughout the course of 2024. Given the unprecedented scale of investment with many bespoke projects being at relatively early stages of the project development lifecycle, a much greater use of uncertainty mechanisms is required than used the past. Ofwat helpfully created different mechanisms to treat the uncertainty, but we question the allocation of some projects to the right mechanism and for an amendment to the

Delivery Mechanism. The right uncertainty treatment is important to support the delivery of the entire programme.

- Price control deliverables: We support the concept that customers should be refunded where projects don't happen. Price Control Deliverables (**PCDs**) are a new concept and some aspects of Ofwat's model go beyond the core concept and are potentially unworkable. We have positive proposals for amending the time incentive and non-delivery PCDs to make them flexible and responsive to regulators' changes, removing a significant potential risk.

- Operational targets and incentives: We have significant concerns with how Ofwat has calibrated Performance Commitment Levels (**PCLs**) and Outcome Delivery Incentives (**ODIs**). Ofwat's failure to capture company specific risk factors in its calibration of PCs and ODIs disproportionately exposes Southern Water to outsized risk. The incentives and performance commitment levels contribute to the overall imbalance on risk closely relate to our chapter on risk and return, as amendments here will feed into our overall balance of risk and return.

- Allowed returns: We have a significant requirement for new capital, both debt and equity, driven by the scale of our investment programme, of which around 90% relates to statutory obligations. To be able to deliver outcomes for customers, it is critical that we can raise the new capital required, and at an efficient cost. Investor sentiment towards the UK water sector is negative, including perceptions of the stability and predictability of the regulatory framework, having deteriorated significantly in recent years.

  It is critical that both the allowed return and risk exposure faced by a notionally efficient company operating in our region is allocated appropriately, considering sentiment towards the broader water sector, investment opportunities elsewhere and investor expectations in respect of the risk exposure of a regulated utility. To set the right level of risk and return, a robust assessment of financeability must be based on an objective assessment of risk exposure, and appropriate consideration of debt and equity positions must be based on that assessment.

8. The overall PR24 process has been difficult with statutory requirements and the regulatory framework changing throughout. Major changes to the statutory requirements companies are required to deliver were made up to and following original business plan submissions in October 2023. The Environment Agency issued the final WINEP in July 2024. This meant that companies had to submit details of new schemes as part of their responses to the DD. In PR24, Ofwat removed the Initial Assessment of Plans (**IAP**) stage in the process where Ofwat feeds back on companies' plans prior to the DDs. This result of this meant companies were only given visibility of key parts of Ofwat's framework at the DD stage giving companies limited opportunity to respond to proposals and approaches that had not been consulted on.[1]

[1] This was particularly acute in the areas of enhancement, and risk and return. Ofwat did not consult on any of the enhancement cost models in advance of the DDs. For risk and return, Ofwat proposed several new mechanisms and approaches. Between the DDs and FDs, Ofwat made many changes to its framework, including making a series of new proposals in relation to risk and return.

Role of the Board

9. The Board of Southern Water regards the combined commitments under our WRMP and WINEP plans as enabling a generational change in the resilience of rivers, chalk aquifers and marine environment of the south. More of our customers are within reach of the sea than anywhere else in the UK and the company listened with great care to customers' requests for changes to what we do and how we work in the environment.

10. The company has preferred nature-based and community solutions over network investment and has established ground-breaking partnerships with every Local Authority in our region to effect Sustainable Drainage that will slow urban water into our systems. We have advocated to schedule our delivery plans to smooth supply chain challenges and customers' bills, and we have worked closely with our shareholders and investors to determine what returns are necessary to gain continued support for our Turnaround and for the largest RCV growth in the sector.

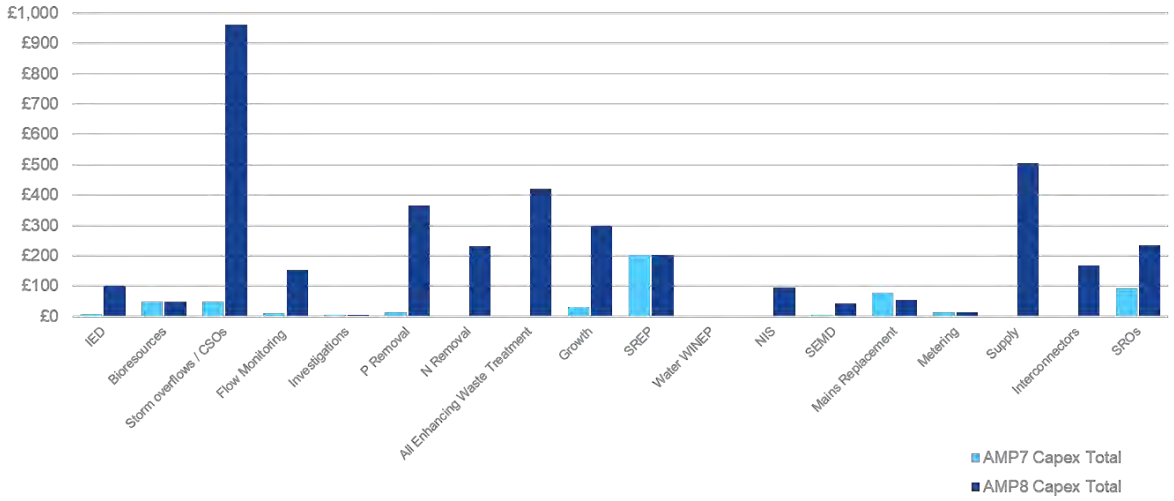
11. The board has concluded that the FD does not provide the right allowances and risk balance given the size and complexity of our business plan. The Board has, therefore, requested a referral to the CMA. We are conscious of the potential for an increase in bills from some aspects of this redetermination process and we will look to at ways to offset possible increases and improve support for vulnerable customers.

12. We look forward to working with the CMA during its investigation and to an outcome which corrects the shortcomings in the FD that we identify in this Statement of Case. This will support the delivery of our plan and meet the interests of customers, the environment and deliver the critical investment, infrastructure and growth across our region.

2. AMP8 – a generational environmental opportunity

13. Our 2025–30 Business Plan proposes investment of more than £8 billion over five years to improve services and it also includes £3.3 billion of environmental projects. This will see us limit our impact on local rivers by reducing the amount of water we take from them, build new long-term water sources, like reservoirs and water recycling plants and upgrade our wastewater treatment sites so they are more reliable and can better support future population growth and improve water quality in 1,000km of our rivers. At the same time, we plan to significantly reduce storm overflows at almost 300 locations along our coastline. Our AMP8 enhancement programme is over five times the allowance for the AMP7 enhancement programme.

Figure 1: Comparison between AMP7 and AMP8 enhancement investment



Source: Southern Water FD

14. Across our region, to meet regulatory and statutory requirements, we will be making generation levels of investment. For example:

15. **Hampshire:** environmental investment including:

- Upgrades to 69 storm overflows to improve the quality of water released to the environment and reduce the number of releases overall
- Major improvement schemes at our [redacted] Water Supply Works, increasing the quality and quantity of water leaving the sites and flowing to customer taps, while making sure there is a more reliable service and a lower risk of experiencing a loss of supply.
- New sources of water in Hampshire through the new reservoir at Havant Thicket being built in partnership with Portsmouth Water, new transfer pipelines bringing water in from other areas and a new water recycling plant, all of which will reduce reliance on local rivers for water supplies and protect precious chalk streams for future generations. The new reservoir alone will make 21 million litres of water available.
- 174km of river improvements along the Test and Itchen and in the New Forest and East Hampshire.

16. **Sussex:** environmental investment including:

- Upgrades to 102 storm overflows to improve the quality of water released to the environment and reduce the number of releases overall by as much as 50% in some areas.
- Major improvements at our [redacted] Supply Works, increasing the quality and quantity of water leaving the sites and flowing to customer taps, while making sure there is a more reliable service and a lower risk of experiencing a loss of supply.
- A water recycling scheme near Littlehampton, to transfer water to the Pulborough area and provide up to 15 million litres per day.
- Water transfers from our neighbouring water companies SES Water and South East Water that together can provide up to 20 million litres per day.
- 447km of river improvements across the county.
- Further improvement to treatment processes and storage at our sites. These will increase the amount of waste that can be treated, and will remove more nutrients, like phosphorus,

from the water we put back into the environment, helping to protect local bathing waters and shellfish beds.

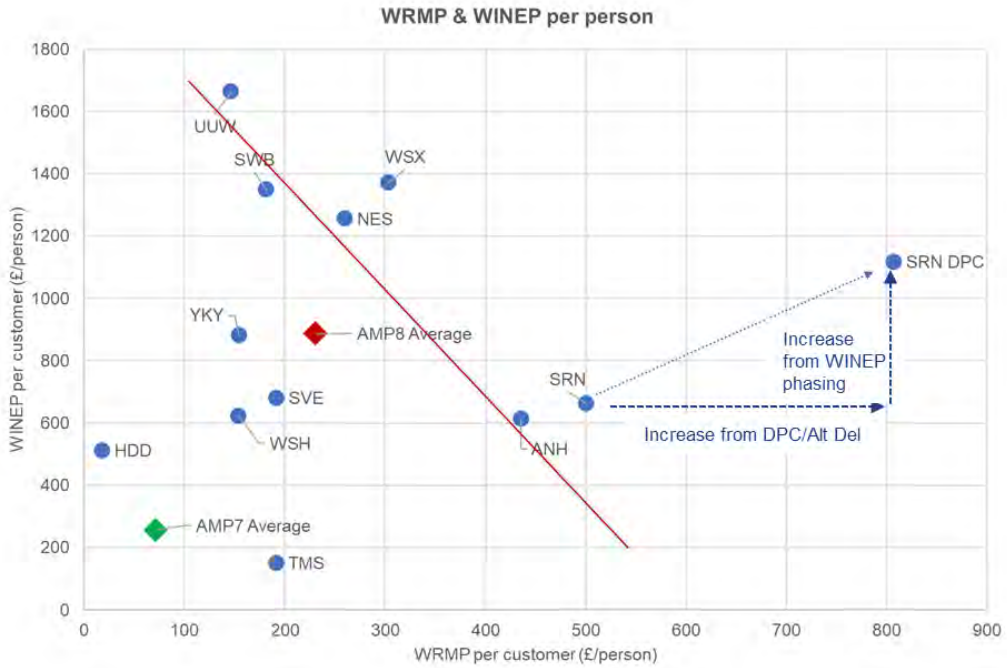
17. **Kent:** environmental investment including:

- Upgrades to 57 storm overflows to improve the quality of water released to the environment and reduce the number of releases overall.
- Major improvement schemes at our [redacted] Water Supply Works, increasing the quality and quantity of water leaving the sites and flowing to customer taps, while making sure there is a more reliable service and a lower risk of experiencing a loss of supply.
- New sources of water in Kent through the construction of a new water recycling plant at Aylesford, producing up to 14 million litres of extra water for the region, leaving more water in the River Medway, protecting this water source for future generations.
- Further improvements to treatment processes and storage at our wastewater sites, continuing to reduce the use of storm overflows in Kent and better control nutrient levels in local rivers and seas, while improving water quality.
- Sustainable drainage schemes, for example installing rain gardens and water butts and fixing illegal sewer connections, run in partnership with local authorities, which will help to reduce local flooding and the use of storm overflows along the Kent coastline.

18. The effect of these requirements is:

- **Largest enhancement programme in a generation:** The EA has crystalised a significant number of statutory requirements, which have a bearing on our operation from AMP8 (2025-30) all the way through AMP10 (2035-40). We are facing a unique compounding of demands, challenges and constraints with the largest WRMP investment plan and a significant increase in WINEP. Together, when accounting for the unwinding of WINEP phasing proposed in our original business plan in October 2023, we have greatest increase in investment and complexity of programmes of any company in the industry. AMP8 statutory requirements, as reflected in the WRMP and WINEP plans, expressed on a £ per person basis, shows that in combination Southern Water is an extreme outlier compared to all other companies.

Figure 2: Challenge of combined statutory investment plans



Source: Southern Water (This analysis is based on investment requirements in March 2024 following submission of the original Business Plan in October 2023).

Increased investment for environmental requirements is widespread through water companies, but particularly acute for Southern Water. We are in a unique position of having both a major water supply/demand programme and a significant wastewater environmental programme – both with a high degree of complexity. Even with the errors in its approach, Ofwat's FD cost allowance for our enhancement programme is larger than its cost allowance for our base costs – we are the only company where that is the case in PR24, as shown in Figure 3 below. This highlights how important it is that we can invest adequately to meet the enhancement needs we have, and how a material challenge to our enhancement costs cannot simply be accommodated within a smaller base cost allowance.

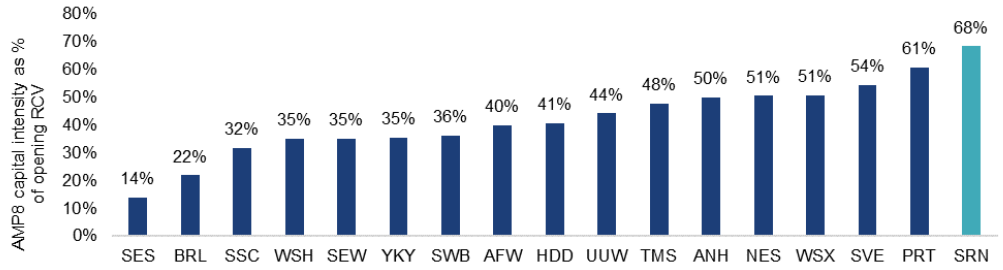
Figure 3: FD enhancement cost allowances as % of base cost allowances

Source: Southern Water FD

- **Programme Complexity:** The largest individual risk that we face is the scale and complexity of our capital programme. We have the largest capital programme as a percentage of RCV in the sector at 68%, as shown in the figure below which demonstrates that Southern Water has the largest capital intensity in the sector. This is a result of the specific regional challenges we are facing.

The environmental challenges we face drive the capital intensity and complexity of the programme. To meet the requirements under our WRMP24 and reduced abstraction licences (resulting from the specific environmental factors in the region), we have needed to consider first of a kind solutions like water reuse and desalination schemes, which are complex and will take multiple AMPs to deliver. We take our stewardship of the environment seriously and want to deliver our largest and most complex programme to protect the unique environment specific to the South East of England.

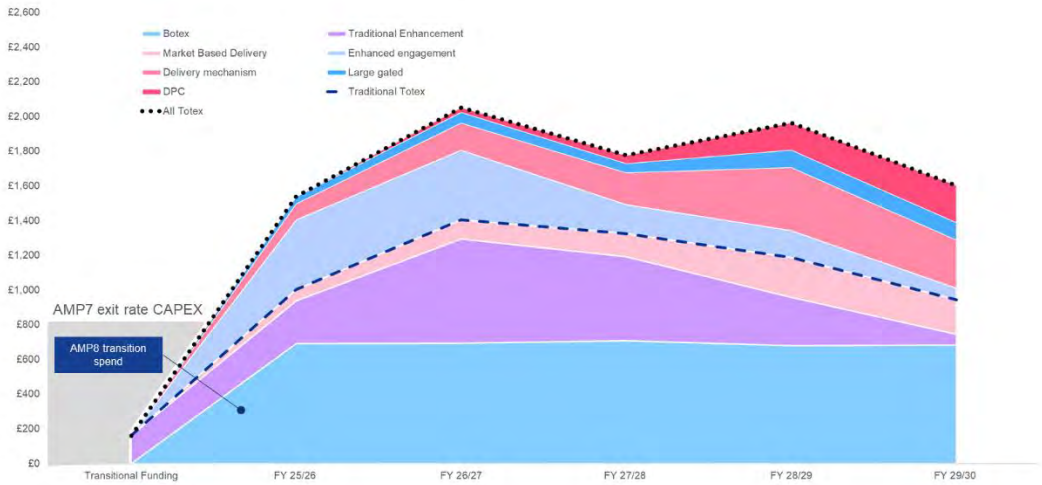
Figure 4: Capital intensity of AMP8 enhancement allowance relative to RCV



Source: Southern Water FD

- **Investment run rate:** Despite pro-active work on procurement and additional in-house resource, the step-change in physical delivery remains a challenge. For AMP8 we recognise the challenge and the risks we face in our delivery programme and therefore we have established an AMP8 Readiness Transformation Plan to deliver our plan, as well as our usual pre-AMP preparation activities. We have engaged external transformation advisors to support us in developing an AMP8 Transformation Plan that builds on the success and delivery of our AMP7 Turnaround Plan.

Figure 5: Increased investment run-rate for AMP8



Source: Southern Water FD

- **Bill impacts:** Given the unprecedented bill increases driven by this price review, we are seeking to limit the impact on customer bills by delaying more of any increase into future periods. We are conscious of the large increase in bills our customers face, predominantly in the first year of AMP8. Where the financeability of the company allows and by utilising ODI penalties we aim to help those who need it most. We want to find a way to use ODI revenue penalty funding to increase the reach of our social tariff to eligible customers so that they benefit from a meaningful discount, rather than the general customer base receiving a negligible bill reduction. We believe the channelling of ODI revenue penalty payments

directly to those most in need is an innovative, simple and fair way to mitigate the growing affordability challenges our customers face while preserving the incentives on equity to drive performance.

We forecast this additional funding will increase the reach of financial support to a further 11% or 17,750 combined-service customers per year, in addition to the 155,500 customers that will be supported by the customer-accepted cross-subsidy. This additional support will reduce the forecast of combined-service customers in water poverty by 2029-30 from 6.5% to 4.7% based on our FD allowed revenue; or estimated from 7.8% down to 5.9% based on increased revenue requested of the CMA in this Statement of Case.

This additional support will complement the financial support package available in AMP8, which includes £12m of customers' debt write-offs from debt-matching schemes, £7m toward the customer hardship fund, £40m of bill discounts via the WaterSure tariff and £172m customer discounts from existing social tariff funding (all values in nominal price-base).

3. What Southern Water does and how Southern Water differs from other companies

19. We are committed to making sure our customers have access to high-quality, affordable and efficient water and wastewater services, while we protect and enhance the environment and our communities. We provide essential services to 2.7 million water customers and more than 4.7 million wastewater customers across Kent, Sussex, Hampshire and the Isle of Wight.

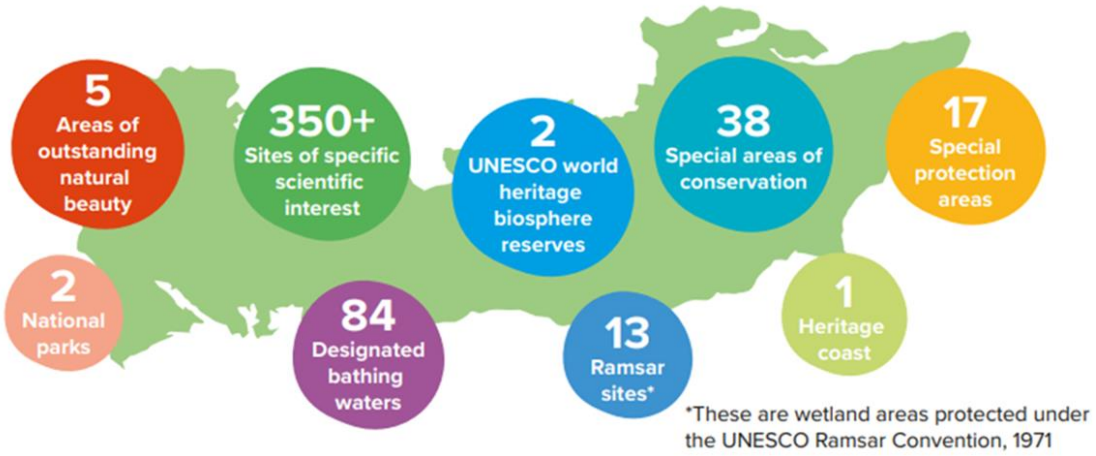
Figure 6: Southern Water region

Source: Southern Water

20. Our plan for AMP8 marks the next stage in the company's transformation to remain constant in our purpose to provide water for life to enhance health and wellbeing and to protect and improve the environment. It is our priority to ensure everyone has access to clean, safe and affordable water and effective and efficient wastewater services.

21. We face unprecedented challenges and demands for change. Our region is home to major towns and cities, more than 700 miles of coastline, 84 bathing waters, 3,400km of river, and hundreds more environmentally significant sites. It also has some of the world's only chalk streams – these are rare habitats for a diverse range of species and a crucial source of our drinking water.

Figure 7: Southern Water region and challenges



Source: Southern Water

22. The South of England is already water-stressed and exposed to drought risks. Climate change brings much greater volatility and intensity in our weather, which places additional strain on water resilience. Larger volumes of water and localised flooding challenge the capacity of our sewer networks as never before. Demand for water and wastewater services will grow as the population grows faster than most other regions. At the same time, in Hampshire we have a legal duty to replace 30% of our water sources in the next five years to reduce abstraction from our chalk streams and protect the natural environment.

23. Our communities have been clear that they want resilient supplies of clean drinking water. They also want better environmental standards applied throughout the water cycle, backed by good regulation and an ambition to improve key river and marine environments. This combination of challenges and opportunities is, we believe, unique in the industry. Consequently, the need for investment and for changes in the ways we deliver it needs a bespoke approach to address the uniqueness.

24. Southern Water operates in largely coastal areas in the south of England. The company predominantly provides wastewater services to the customers of other companies that supply water only; we supply both water and wastewater services to a relatively small proportion of our overall area.

25. We are different to many other water and wastewater companies and yet these specific differences are not sufficiently accounted for within Ofwat's price control framework that puts an emphasis on a one size fits all approach to assessment. Southern Water's business is dominated by the coastline. We have the largest volume of shellfish waters, one of the highest amounts of bathing waters and the greatest population living in coastal communities. At the same time, we have the highest proportion of chalk streams requiring protection and a legacy of complex distinct non-contiguous water operations. Being in the South-East of England, which is projected to grow the most of any region in the UK over the next 25 years, means we are also exposed to economic and labour cost

pressures not experienced elsewhere. Failure of the regulatory price setting framework to account of these factors is consistent theme across our Statement of Case.

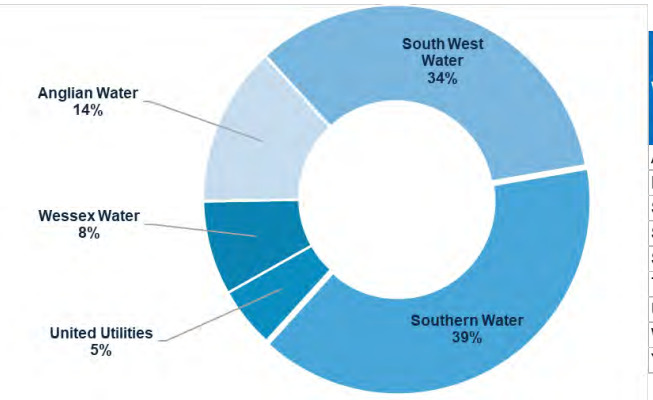
- **Shellfish waters:** These are designated for the protection of economically significant aquatic species to ensure a high quality product for human consumption. We have the largest volume of shellfish waters in the industry. The risk of impacting these shellfish waters is exacerbated by dense urban populations near these waters, such as Southampton and Portsmouth.

  Environmental standards are typically stricter in relation to shellfish waters as shellfish can accumulate bacteria and toxins from surrounding waters (causing foodborne illnesses if contaminated). Even a short discharge into these waters may be considered impactful by the EA, whereas a similar discharge in another area would not be considered impactful.

  The level of evidence required to prove no impact in relation to shellfish water is extremely high. Pollution incidents in shellfish waters that would be classed as category 4 elsewhere are considered category 3 and above due to the lower tolerance of pollution and higher burden of proof. Importantly, category 4 incidents are not in scope for the total pollution incidents performance commitment (PC) defined by Ofwat.

  Southern Water has the largest number of storm overflows discharging into designated shellfish waters in England making up almost 40 per cent of all such storm overflows, at a time when environmental regulation is increasingly concerned with the operation of overflows.

Figure 8: No. of overflows discharging near a shellfish water (<1km)



Water Company	No. of overflows discharging into or near a shellfish water (<1km upstream in hydraulic continuity)
Anglian Water	58
Nortumbrian Water	0
Severn Trent Water	0
South West Water	147
Southern Water	170
Thames Water	0
United Utilities	22
Wessex Water	34
Yorkshire Water	0

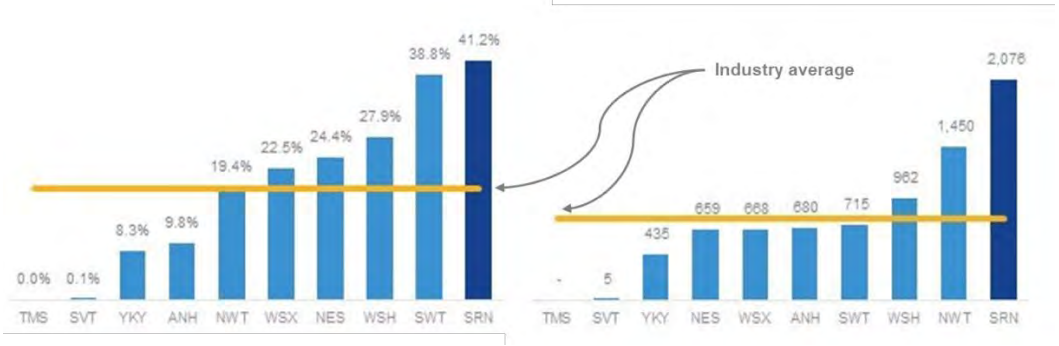
Source: Southern Water analysis of industry data

- **Bathing waters:** These are protected areas of water which undergo regular bacteria testing by the EA. Protection of these waters is considered important due to their regular use by the public and for broader environmental reasons. Discharges to bathing waters are more likely to be considered impactful by the EA, as with shellfish waters, and consequently count as a category 3 or above pollution incident thereby affecting our performance against the total pollution incidents PC.

  While there are bathing waters all around the UK, we have a higher coastal population compared with other regions. This means a pollution is more likely to reach a bathing water and therefore be classified by the EA as at least a category 3 incident impact. We also have the third highest number of bathing waters after Welsh and South West Water. Many of the bathing waters are considered public amenities. Closure of a beach due to a discharge

increases the impact assessed by the EA, which may increase the pollution incident category. This is important where incidents that would normally be a category 4 are now classed as category 3.

Figure 9: Coastal population by company (000s and %)[2]



Source: Source: ONS data on coastal towns and cities

More than 40% of our customers live in coastal communities, higher than all other wastewater companies, and significantly above the industry average of 20%. Having such a high concentration of customers in coastal areas presents significant challenges for our wastewater networks, which has not been accounted for by Ofwat models in relation to increased costs for pollutant permits, saline impacts and space constraints.

- **More chalk stream water resources:** Our region is one of the most water stressed in the UK and will become more so. In Hampshire we are going to reduce water abstraction from 181 million litres a day in 2024–25 to 132 million litres a day in 2049–50, of which almost all will be seen through reductions in the amount we abstract from the iconic Test and Itchen chalk streams. We are planning to replace the equivalent of around 30% of our water supplies over the next five years – equivalent to around 80% of the water we supply in Hampshire. The last time new water resources were developed on this scale in the UK, was to support the fast-growing industrial cities of Liverpool and Birmingham in the late 1800s. We must be custodians of these fragile and precious habitats and ensure they are protected for future generations while providing longer-term solutions for more sustainable water supplies. Southern Water has the highest proportion of chalk rivers in England and Wales, at a time when environmental regulation is requiring reduced extraction.

- **Non-contiguous water network:** Southern Water's water business operates across five distinct regions, each with a unique asset base. The regions are not interconnected in any way, giving rise to higher operational, resource and logistical costs, and an inability to access many efficiencies available to peer water companies of a similar size but with contiguous operational areas.

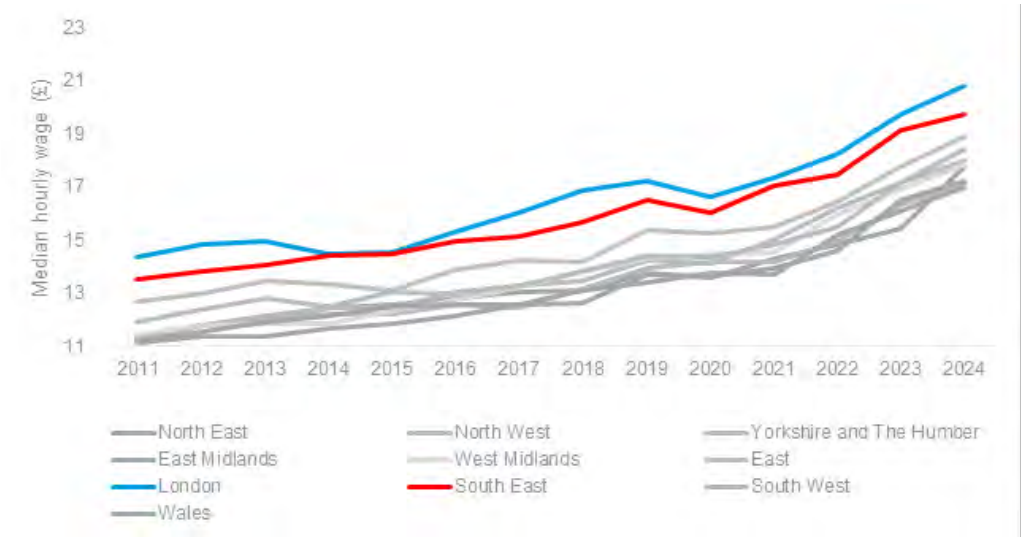
  As our water customers are in non-contiguous regions, we need to build new supply solutions in each individual water resource zone (WRZ) or coordinate with neighbouring water companies whose objectives may not align with ours. This makes managing increased drought resilience more challenging for us. The industry's shift towards a higher standard of drought resilience (from a 1 in 200-year to a 1 in 500-year event preparedness level) and the

2 Southern Water is denoted as 'SRN' in this Figure.

need to adapt to climate change impacts necessitate significant investment in water resource management. We are undertaking one of the largest and most complex sets of water resource schemes ever seen in the sector. This ambitious plan includes a range of initiatives, including water recycling, reservoir construction, supply interconnectors, and network resilience enhancements.

- **South-East growth:** Tightening labour market conditions will continue to have a growing impact on all water companies but are likely to have a disproportionate impact on the region that we operate in, as well as our neighbouring regions, given trends being observed in the market. In particular, the size and growth in infrastructure investment, the need to grow workforce capacity, and key labour market indicators such as uptake in training, the workforce age profile, and the reliance on migrant workers.

Figure 10: ASHE Regional hourly median wage for basket of Standard Industrial Classification codes



Source: ONS's Annual Survey of Hours and Earnings (ASHE)

Unprecedented levels of infrastructure investment in the UK will be most concentrated in the South East, meaning we face stiff competition for skills and resources both within and across sectors. The AMP8 period will see nearly a third of all UK water sector investment concentrated in the South-East, which is more than any other region. Beyond the water sector, infrastructure investment more broadly will also be most concentrated in the South-East and its neighbouring regions, which places us in a unique position as we compete with more companies for skills and resources both within the water sector, and from other sectors that share our supply chain (e.g., energy and transportation, respectively).

The construction sector, which will be a major contributor to the delivery of infrastructure investment, is currently most concentrated in London and the South-East, which makes up a third of total UK construction output. This is set to experience the most growth (+10% / ~£6bn) through to 2027, compared with any other region and will add pressure to regional wages.

Despite this, regional wage inflation has not been accounted for by Ofwat, so we are facing cost pressures that have a material impact on the level of our efficient costs given that labour is by far the main input used by companies.

The South-East of England is projected to grow the most of any other region in the UK over the next 25 years. A growing population is a major contributor to increased demand for water. Increased investment is required to meet the increased demand.

We have five water treatment works coming to the end of their useful lives which require replacing in AMP8, adding a further £436 million to our capital programme. Investment is required to ensure we continue to provide high quality and safe drinking water, comply with the standards set by the DWI, and meet the demands of a growing population. The population equivalent served by these sites could potentially grow by 27% over AMP8 from 710,000 to 900,000. Therefore, it is critical that we expand our network to accommodate growth.

4. Southern Water's recent history

26. Southern Water's recent history and transformation can be characterised in four phases. The first phase (full company reset) from 2017 is when the company was investigated and penalised for serious failures in the operation of sewage treatment sites, and the deliberate misreporting of performance information. From the start of AMP7 underfunding, resulting in bills significantly below the national average, contributed to ongoing issues including poor operational performance leading to further reductions in revenues from regulatory penalties.

27. The serious failures in the operation of sewage treatment sites and deliberate misreporting led to a full reset of ethics and transparency across the company. The ethics and transparency programme places training requirements on all employees and continues to be in place and regularly updated. We launched Beachbouy (an online portal that gives near real-time information about releases of stormwater or wastewater along the coast), and improved organisational compliance enshrined in a series of Section 19 undertakings that are concluded. The company was fined £90m by the EA, £3m by Ofwat and a further £123m was refunded to customer bills. More than £26m was invested in wastewater treatment work capacity and external dividends were stopped.

Figure 11: Southern Water transformation plan – phase one

Source: Southern Water

28. The Section 19 undertakings contain a wide range of corrective actions and interventions across seven themes:

- Customer redress measures;
- Technical review of Wastewater Treatment Works;
- Organisational compliance process measures;
- Organisational cultural change measures;
- Ensuring Transparency;
- Condition P Certificate Assurance Undertaking; and

- Reporting on Compliance with the Undertakings.

29. We have now concluded the work on all the Undertakings; our focus now moves to embedding the improvements and monitoring the effectiveness of that embedment. We provide a significant amount of data to the Environment Agency and Ofwat about the performance of our assets, and any wastewater or sewage discharges we make into the 'water environment' such as rivers, streams and coastal waters. We are committed to transparent reporting of high-quality data that can be trusted by our customers, stakeholders and regulators.

30. Another critical feature of Southern Water's recent history has been the cycle of underfunding, resulting in bills significantly below the national average, ongoing issues including poor operational performance leading to further reductions in revenues from regulatory penalties creating a downward regulatory spiral. Ofwat's regulatory benchmarking approach and rigid use of the concept of a 'notional company' fails to consider the scale of challenge for a company in turnaround. The one-size-fits-all regulatory regime makes it virtually impossible for poorer performing companies in turnaround to improve. In simple terms the regulatory regime:

- Relies on notional targets and allowances that fail to recognise actual company performance; and
- Relies on a comparative benchmarking regime giving little appreciation to regional variation or circumstance.

31. This can and has led to:

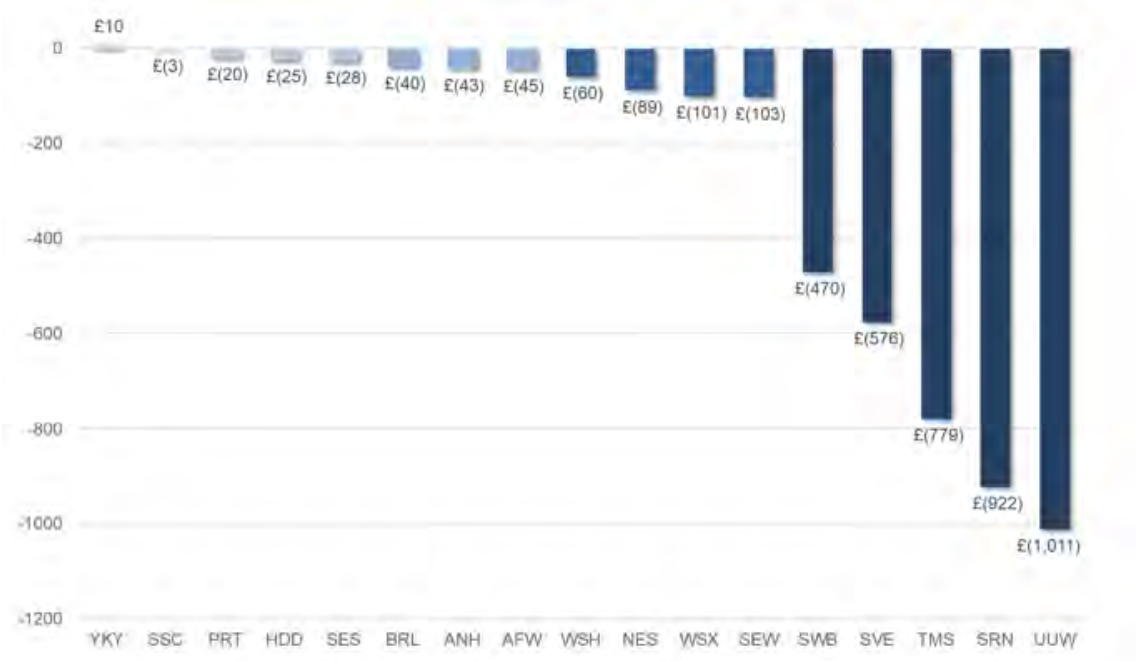
- Performance doom loops that the regulatory regime does nothing to assist with even where shareholders have supported significant additional investment over price review allowances, through new equity, and received no dividends; and
- A situation that is not sustainable and risks making companies uninvestible.

32. Ofwat's regime needs to be adaptable with sufficient flexibility to support all companies and hence all customers equitably. Instead, even though during the period 2020-25 (AMP7) we have delivered significant improvements in in many areas, we have been subject to large performance penalties. Our performance has improved, but has not kept pace with the rate of improvement required by Ofwat, and in some cases, is still not at the levels that Ofwat expected of us at the start of AMP7.

33. During AMP7, it is not just Southern Water that has been underperforming Ofwat's price controls. Over 80% of the sector companies have received more performance penalties than rewards, with net penalties more than £300 million for the first four years of the control period.

34. This is despite the sector significantly overspending its cost allowances in seeking to deliver its targets. In the first four years, the sector had overspent its wholesale cost allowance by £3.6 billion (11%), and its retail allowance by £0.6 billion (21%). This does not indicate a balanced regulatory package and is clear evidence of an overall miscalibration of the investment and service package at PR19.

Figure 12: Totex spend versus allowances in AMP7 to 2023/24



Source: Southern Water analysis of APR 2024 industry data

Figure 13: Total forecast AMP7 ODI penalties for common PCs (£m)

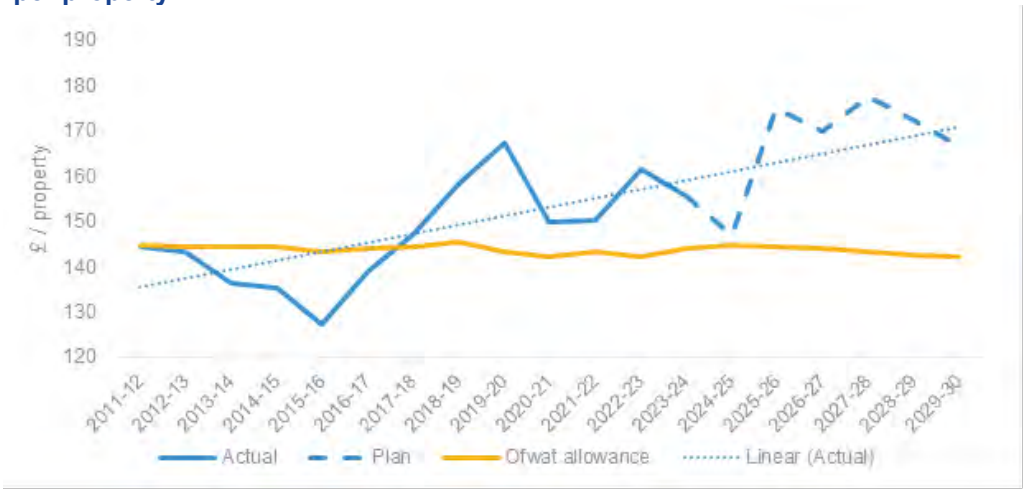
Source: Southern Water analysis of APR 2024 industry data

35. There has also been an increase in enforcement action and investigations into the sector.

- **Underfunding:** An important cross check of Ofwat's modelling should be to assess whether in aggregate the industry notional company would be sufficiently funded (before any atypical adjustments). This is illustrated by looking at the median unit cost allowance vs industry unit costs. If Ofwat's modelling were delivering sufficient funding, we should expect to see industry median unit costs tracking allowances very closely with variances above or below attributable to company efficiency differences. This is simply not the case for the wholesale

water model as illustrated in Figure 14 below, even before catch-up and frontier efficiencies are applied.

Figure 14: Wholesale water median modelled allowance per property vs industry median cost per property



Source: Southern Water analysis of Ofwat FD Water Models

This chart shows that there is a clear trend of industry median unit costs increasing over time. This is driven by an increasing tightening of water quality standards, enhanced monitoring requirements and an increasing marginal cost of water arising from environmental requirements relating to water body protections. The PR24 water models do not capture these effects leaving companies increasingly under-funded. Had the models been used historically they would have underfunded the industry in every year since 2017/18.

Ofwat's PR24 approach to capital maintenance lacks a forward-looking element. For example, there is neither a cost driver included in the econometric models which could reflect future trends in capital maintenance requirements, nor is forecast data used to estimate model coefficients. Backward-looking methods assume that the past is representative of the future. These methods can be a useful starting point to understand historic trends in capital maintenance and typical expenditure requirements. However, they are not well suited to consider the 'effective health' of our asset base, namely, condition, age and performance or the 'efficient' future investment profile for our asset base. Deterioration modelling, and performance trends predict that Southern Water is facing a generational peak in capital maintenance requirements in AMP8 and beyond. This has not been accounted for in Ofwat's modelling.

We have needed to overspend our allowance for the wholesale water price control over multiple AMPs to maintain our asset base

At each price review since PR04, Ofwat has provided us with an expenditure allowance substantively below our requested expenditure for the wholesale water asset base. Over the four price controls we cumulatively were provided with £378m less expenditure than requested for wholesale water botex.

Whilst we have not appealed these determinations, it has been necessary to spend more than Ofwat provided to meet our statutory duties to maintain our assets and improve performance. We needed to spend closer to the amounts originally requested to maintain asset health over those periods. In fact, by the end of AMP7, we will have spent over £200m more than requested on our wholesale water asset base over the course of the four AMPs,

which is £585m more than allowed for by Ofwat. This level of investment beyond our allowances is not sustainable and threatens the investability of the business.

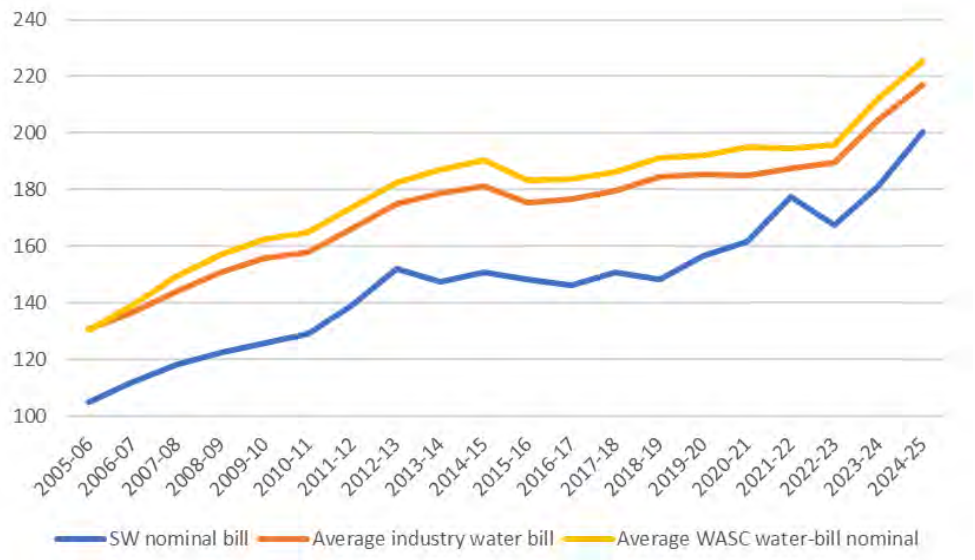
- **Low bills:** Our plan for AMP8 features a large increase in investment, which has a significant effect on bills. The effect of the increase in investment and bills is marked by 2 lost decades of under-investment, particularly in the water network, as outlined above.

  Ofwat's regulatory decisions have suppressed investment and bills to such an extent that water bills in the Southern Water region have been the lowest among water customers for at least 20 years and significantly below the average national bills, as shown in the figure below.

  In fact, Southern Water's nominal bill has remained between 10% and 60% lower for 20 years when compared to industry and water average bills. While the picture on the wastewater bill is less stark, Southern's combined bills have been consistently below the average industry level. Southern Water's bills have also been reduced in real terms. The figure below shows how our bills have reduced by over 20% in real terms over the last decade. While we support efficient bills, we reflect that some of the bill reduction could have been used to invest in asset health over the last decade.

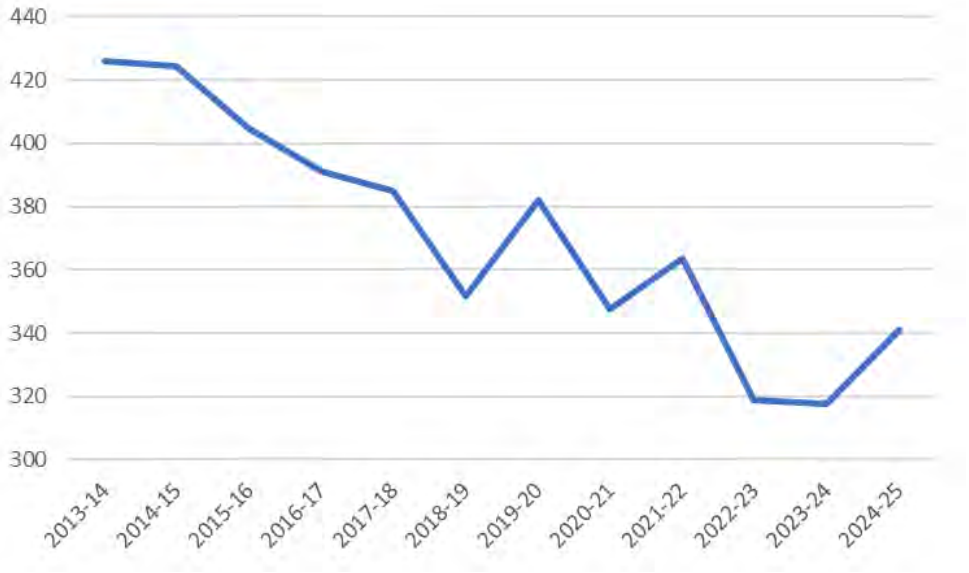
  Our customers have told us that putting off investment to future generations is the wrong thing to do. What this analysis shows is that the future generation will now have to catch up on the lost decades of investment. Had Ofwat decisions in the past allowed for greater investment, then this would have allowed for investment and bills to be spread across a longer time and the increase that we are portraying for the next 5 years may not have been required.

Figure 15: Southern Water's water bill compared with national bills since 2005 (nominal terms)



Source: Southern Water calculation.

Figure 16: Southern Water's combined bill level in real terms (2013/14 prices)

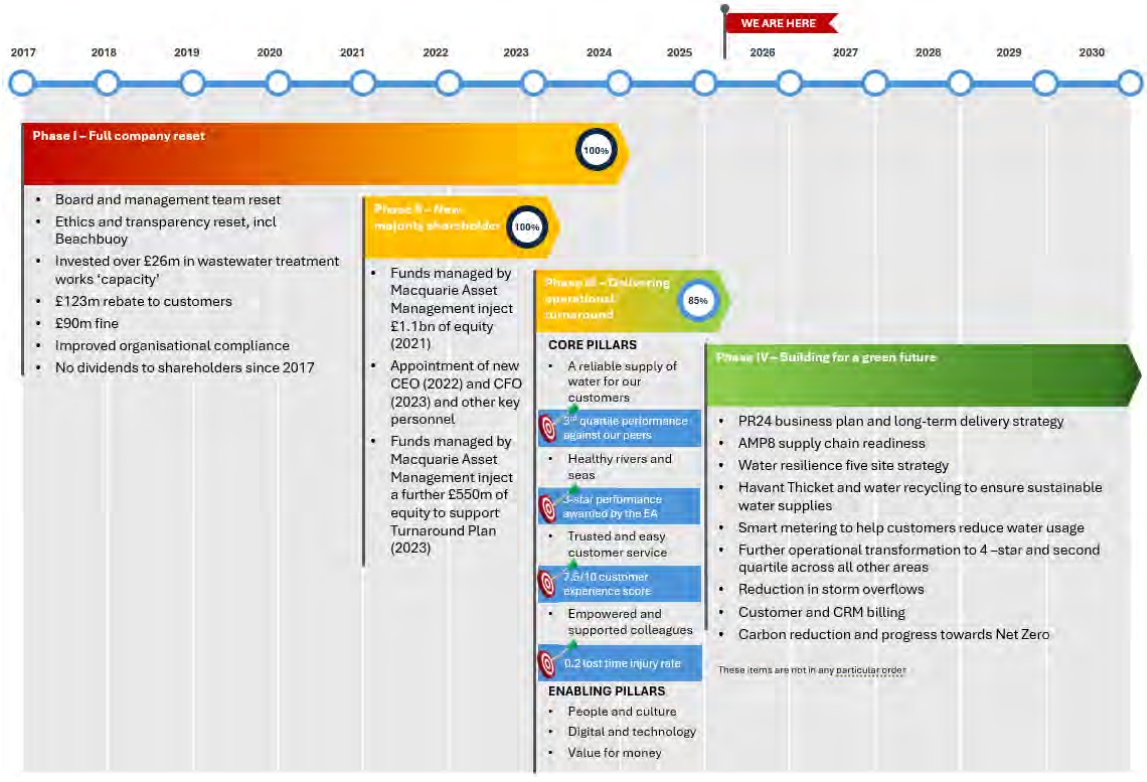


Source: Southern Water calculation.

5. Refinancing and turnaround – the private sector solution

36. The second and third phases of Southern Water's transformation are tied to new ownership and refinancing (New majority shareholder) and operational turnaround (Delivering operational turnaround).

Figure 17: Southern Water transformation plan



Source: Southern Water

37. From 2021 Southern Water has gone through the private sector solution for a company in distress by changing ownership, addressing performance, securing new investment and implementing organisational and cultural change at executive and Board. Poor performance, underfunding, and regulatory failures including mis-reporting, resulted in a necessary re-capitalisation of Southern Water group in 2021 after funds managed by Macquarie Asset Management ("MAM") invested £1.1bn to support the business. The timeline of events surrounding resetting the company are illustrated below.

38. New management and a strengthened Board were put in place over 2022-23 and a Turnaround Plan was established to address past performance and get the business on a sustainable footing supported by MAM. The Turnaround Plan has already delivered a step-change improvement in Operational KPIs – both in absolute terms and relative to peers – as well as increased monitoring and controls on financial performance.

- **New shareholders and equity injection:** After recapitalisation to obtain a majority share in the business in September 2021 for £1.1bn, MAM have subsequently invested a further £550m of new equity, in total an equivalent of £1,500 extra per household, over the period from 2021-2023. MAM remains committed to Southern Water's Turnaround Plan over the 2025-2030 period and has committed a further £900m of equity to support the business.

- **Strengthened Board and new Executive Team:** The Southern Water Board has been supplemented with new qualified and experienced independent directors and a new Executive Team was put in place over 2022-23 bringing experience and expertise from within the industry and from outside. Board and Executive Team members are outlined on the following page.

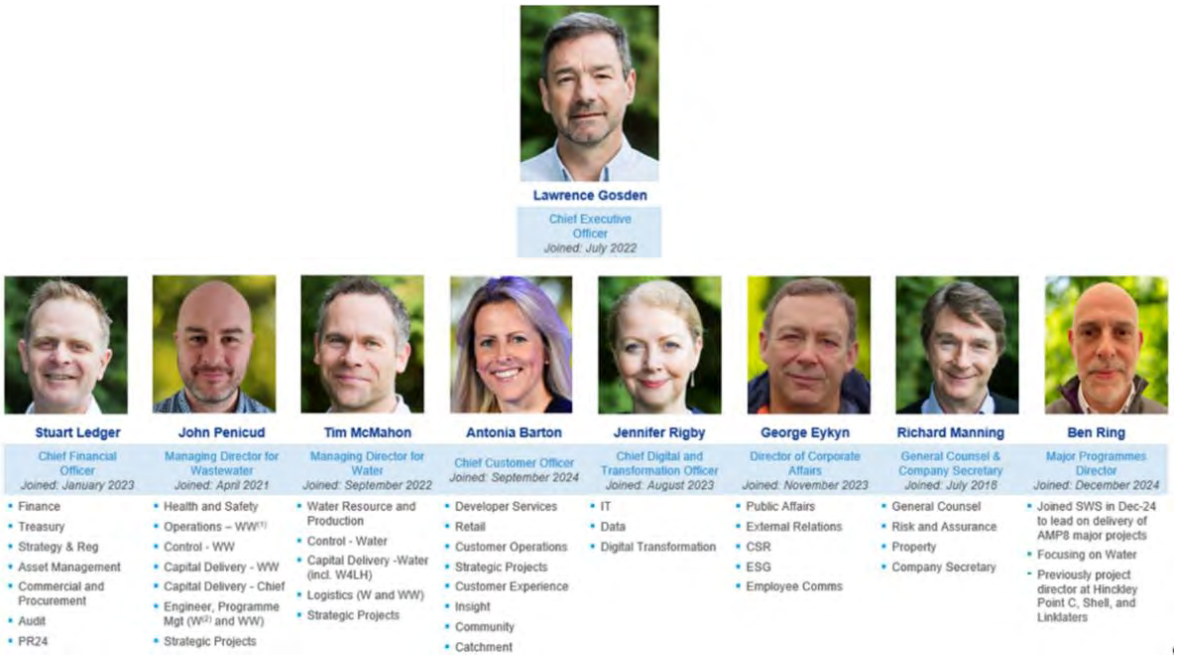
The Board sits in a critical position, balancing the interests of our customers, public authorities, our colleagues, our investors and our many other stakeholders. It looks both to the short term, not least our Turnaround Plan, and to the long term, including the major environmental investments needed. The Board remains steadfast in its resolve to provide services at costs that represent value, and which allow Southern Water to invest for the longer term in wider environmental protections and always ensure the financial resilience of the company. Balancing these critical trade-offs is at the heart of Board governance work.

Figure 18: Southern Water Board of Directors

Source: Southern Water, as at date of submission (Dame Gillian Guy OBE and Phil Swift retiring 31 March 2025).

The Executive team, alongside members of the company's senior leadership team, support the CEO in driving the implementation of strategy in the company. Comprised of the senior leaders of the functions and operational units, executive sub-committees meet regularly to consider performance and make decisions on operational matters; oversee the company's transformation programme; and consider health, safety, security and wellbeing, ESG and risk and compliance.

Figure 19: Southern Water Executive Team



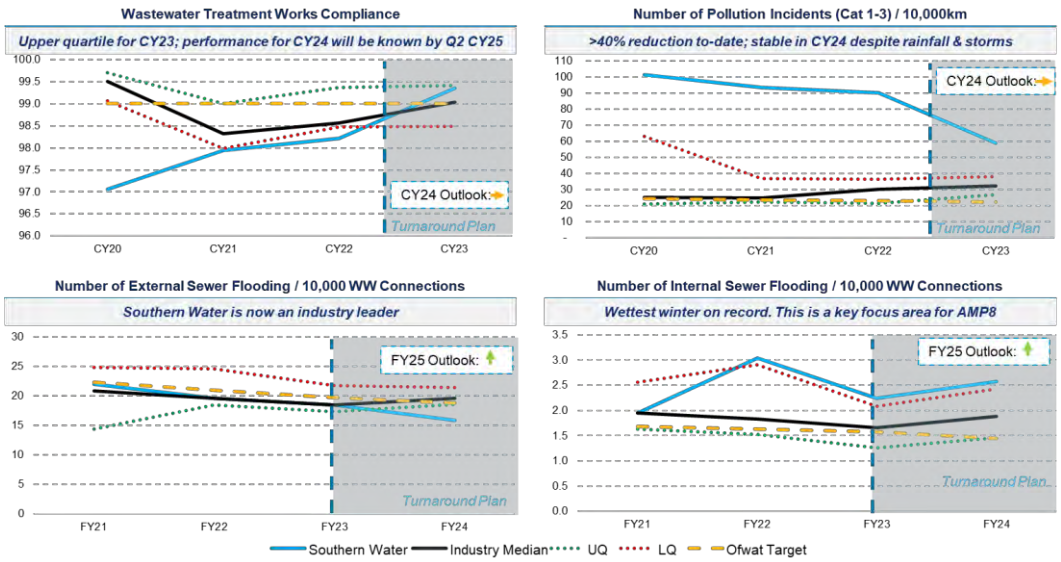
Source: Southern Water

- **New Corporate Culture:** Southern Water under the new leadership team has worked to implement a fundamental shift in business culture, improving relationships, transparency, engagement and accountability;

- **Increased investment and Operational Turnaround:** In this regulatory period, we have invested 50% more than allowed for by Ofwat at PR19. No dividends have been paid to external shareholders since 2017 and we do not expect any to be paid until after 2030. Overall new equity put in by shareholders since 2021 is greater than total dividends since privatisation.

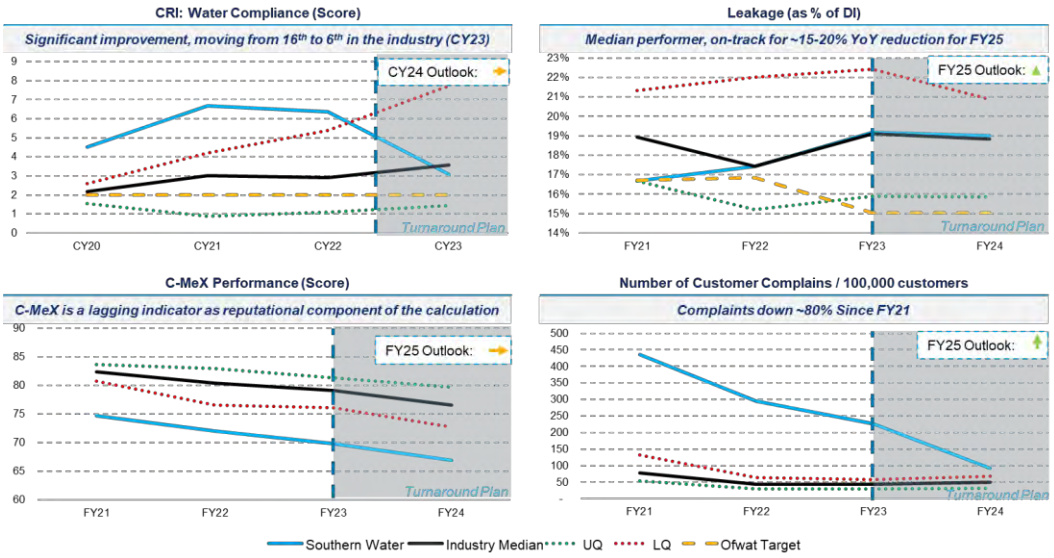
  Additional investment has supported delivery, and we have already made significant progress in many areas with improvement in nine of the twelve key Ofwat PC measures including those illustrated below.

Figure 20: Turnaround Plan – Wastewater: Key Performance



Source: Southern Water

Figure 21: Turnaround Plan – Water: Key Performance



Source: Southern Water

Notable achievements from our Turnaround plan include:

- On target to reduce leakage by 10% in 2024
- Written complaints down 43%, billing phone complaints down 31%
- >40% reduction in pollution incidents in 2 years
- We have reduced water quality breaches in 2024 and forecast an improvement in CRI in line with other companies
- Improved self-reporting performance with a 12% on last year

Nevertheless, we recognise that we remain below average on some metrics and need to go further in AMP8.

39. The final fourth phase of Southern Water's transformation (Building for a green future) will be enabled by the delivery of our AMP8 investment programme, secured through the PR24 price review process. It is not in the interests of our customers or our environment for Southern Water's Refinancing and Turnaround to fail. We ask the CMA to implement the remedies outlined in our seven areas of dispute and to act in support of our Turnaround.

Southern Water Statement of Case

Executive summary

from Southern Water

Executive summary

Introduction

1. We have identified 7 areas of Ofwat's PR24 Final Determination (**FD**) in which there are material errors resulting in a price control package which, contrary to Ofwat's duties, does not allow us to finance our functions and prejudices our ability to deliver in the best interests of our customers and our environment. This Statement of Case addresses each of these grounds in turn and suggests the remedies which we believe are required to allow us to deliver a resilient service to our current and future customers:

   - Ground 1: Risk and financeability;
   - Ground 2: Base costs;
   - Ground 3: Enhancements expenditure allowance;
   - Ground 4: Treatment of uncertainty through mechanisms;
   - Ground 5: Price control deliverables (**PCDs**);
   - Ground 6: Performance Commitments (**PCs**) and Outcome Delivery Incentives (**ODIs**); and
   - Ground 7: Weighted Average Cost of Capital (**WACC**).

2. In conducting the PR24 price control review, Ofwat was required to act in accordance with its statutory duties. This includes (1) its duties to further the consumer objective; to secure that companies are able (in particular, by securing reasonable returns on their capital) to finance the proper carrying out of their functions; to secure long-term resilience; to contribute to the achievement of sustainable development; to consider the importance of promoting economic growth in taking regulatory action; and (2) its strategic priorities as determined by Government in relation to the environment, delivering a resilient water sector and serving and protecting consumers. A more detailed overview of Ofwat's duties is provided in Annex 2.

1. Risk, return and financeability

3. Striking the correct balance of risk and return is critical for us to deliver value for customers in AMP8, in particular because we need to attract a significant amount of capital to deliver unprecedented levels of investments, meet ever increasing performance targets and protect our environment. For this reason, the **prime responsibility for any regulator setting the PR24 price control is to ensure there is a balance of risk and return, to ensure the financeability of the operation**.

4. AMP8 represents a step change in the level of risk that we face. New regulatory requirements, the unique ecological characteristics of our region, climate change, population growth and the significant degree of stretch in our performance commitments all contribute to a material increase in risk. A thorough assessment of risk and return and the impact on financeability, and intervention to mitigate any such impact, is a critical step in concluding whether companies are likely to succeed in delivering within the confines of Ofwat's regulatory determination.

5. Our AMP8 programme has many more requirements than those of other companies in the sector due to the unique characteristics of our region and it imposes materially more risk on us than compared to AMP7.

1.1. Errors

6. We have conducted our own risk analysis, inter alia, to quantify the likely range of Return on Regulated Equity (**RoRE**) performance under the FD for a notional efficient company operating in our region. We conclude that risk is not balanced with return and therefore interventions are required.

7. An efficient company's performance reflected in the analysis is based on the median observed performance in the sector over AMP7. In AMP7, only three companies performed at the median for the sector or better across all performance metrics including wholesale totex, ODIs and retail on a four year cumulative basis. A company performing at the median on all performance metrics is therefore in the top three companies in the sector (or upper quartile) based on AMP7 data. We have also made limited and targeted adjustments where our analysis indicates that the characteristics of our region (e.g. as a coastal one) would be reasonably expected to impact performance of a notional, efficient company.

8. In this SoC, we demonstrate the following errors:

- **Prime Error: Significant imbalance of risk and return, with an expected downside skew:** Our analysis is comprehensive and robust. It shows that the FD subjects us to a level of risk that results in a materially negative outcome on an expected basis: the base-case median expected scenario results in -375bps of RoRE (£680m net penalties, 8.0% of AMP8 totex) and a plausible downside scenario results in -641bps RoRE (£1,164m of net penalties, 13.6% of AMP8 totex), as shown in the table below.

Table 1: Our risk analysis: Significant risk exposure for a notional Southern Water

	Our risk analysis for a notional company like Southern Water		
	P10	**P50**	**P90**
Totex	-3.74%	-2.60%	-1.50%
Retail	-1.21%	-0.20%	0.78%
ODIs + MeXes	-1.56%	-0.50%	0.57%
Financing	-2.33%	-0.38%	1.53%
Revenue & Other	-0.08%	-0.03%	0.00%
RoRE (additive)	**-8.92%**	**-3.70%**	**1.38%**
RoRE (simulated)	**-6.41%**	**-3.75%**	**-1.12%**

Source: Southern Water risk analysis.

9. Our analysis indicates a materially negative base-case RoRE (simulated) P50 and thus an expected return less than the allowed return. This is a significant and material penalty and impedes an investor's ability to earn the allowed return – even in the best-case scenario the RoRE (simulated) P90 is negative. The degree of negative RoRE means that the FD is not a 'fair bet' as investors are not likely to earn the required return.

- **Contributing errors: Ofwat's FD included a series of errors, which are detailed throughout our Statement of Case:** These errors taken in aggregate allocate a disproportionate degree of risk to us through the regulatory incentive mechanisms as a result of a series of errors including: (i) insufficient allowances; (ii) punitive outcome delivery incentive (**ODI**) rates; (iii) an overall skewed package of ODI incentives; (iv) Performance Commitment (**PC**) targets that do not reflect company-specific characteristics; (v) insufficient risk mitigations and (iv) an excessively punitive PCD framework. We discuss each of these areas in turn in the sections below.

- **Error in calculating risk correctly:** Ofwat failed to adequately consider the relationship between risk and return throughout the PR24 process which resulted in it falsely concluding that the risk derived from the FD was balanced with return. The PR24 Final Methodology did not find it necessary to "*prescribe a link between RoRE risk analysis and base allowed returns*"[1] and the risk analysis performed in the DD materially misstated the determination risk. The FD risk analysis represented a better but still deeply flawed methodology with unreliable results. Most pertinently, the analysis made inaccurate assumptions about symmetry of performance to derive base-case risk, frequently used AMP6 data in place of more recent and more relevant data, omitted key factors like embedded debt and non-delivery PCDs, and was of limited sophistication with Monte Carlo analysis only used for Outcomes risk.

  Our risk analysis represents a significantly improved methodology which produces substantially more reliable results. Our analysis uses more up-to-date and representative data and adopts a more statistically robust approach and indicates Ofwat's analysis materially understated the FD risk.

- **Errors in calibrating the risk mitigation mechanisms:** The FD included the Outcomes Adjustment Mechanism (**OAM**) and Aggregate Sharing Mechanism (**ASM**), both of which were designed to limit risk exposure, but only in totex over/underspend and ODI rewards/penalties. The calibration of these mechanisms fail to mitigate risk sufficiently; and

- **Financeability error:** Finally, there were several errors in Ofwat's debt financeability assessment and its equity financeability assessment was inadequate. Consequently, it had no robust basis to conclude the FD was financeable.

1.2. Impacts

10. Our risk analysis forms the basis of our financeability testing to assess whether a notional company operating in our region could attract the capital it requires, both debt and substantial new equity, in order to deliver the AMP8 investment programme. Correcting for the errors made in the financeability assessment in the FD, including the lack of adequate testing of equity financeability, our analysis, informed by our risk analysis, highlights several critical issues that render the notional company unfinanceable under the FD for both debt and equity.

11. An appropriate debt financeability assessment, using market-based tests, reveals that the notional company is unable to achieve the target credit rating of Baa1/BBB+ and instead would be rated at or below the lowest investment-grade rating, with no financial resilience against downside risk (P10). An assessment of equity financeability, using appropriate tests informed by market considerations and rational investor behaviour, shows that the risk-adjusted returns implied for the

[1] Ofwat, December 2022, PR24 Final Methodology – Appendix 10 Aligning risk and return, page 8, SOC-11-0009.

notional company are not competitive against comparators, and furthermore, an excessive proportion of the allowed return is placed at significant risk.

12. Those results demonstrate the notional company is not financeable under the FD given the risk exposure and allowed returns set by the FD, and consequently would be unable to attract the new capital required to deliver the AMP8 investment programme and outcomes for customers.

13. Overall, we have identified a series of errors in the FD, which critically require remediation to balance risk and return and to support our ability to procure capital in AMP8. Our own, robust assessment demonstrates that the FD is not a fair bet and is unlikely to attract the necessary levels of investment.

1.3. Remedies

14. The prime error in Ofwat's FD is the overall imbalance of risk and return, which threatens the financeability of the operation. We ask the CMA to remedy the series of errors that we outline in the remaining grounds below, each of which will have a positive impact on mitigating the downward skew in risk that we have demonstrated. We demonstrate in our Conclusion chapter the extent to which the remedies in this SoC could remedy for this prime error.

2. Base costs

15. The base cost allowance is set to fund the costs needed to deliver the base level of routine service and to maintain existing assets. This allowance is set through a combination of sector-wide econometric modelling and out-of-model adjustments and Cost Adjustment Claims (**CACs**) to account for unique company-specific circumstances.

16. Allowances for capital maintenance are included within the overall base cost allowance without any adjustment to account for the actual health of our asset base. This has led to systemic under-funding, meaning we have had to invest £585m above our base allowance of £3.6bn in our wholesale water asset base over the last 20 years to meet our statutory capital maintenance requirements. This is unsustainable.

2.1. Errors

17. The FD provides an inadequate base cost allowance due to several distinct errors. We have concentrated on Ofwat's methodological approach to calculate base costs, and have identified errors across all three aspects of Ofwat's approach in setting the base cost allowance.

18. First, Ofwat has not applied its own modelling principles consistently in its econometric modelling:

- **Error 1: Wastewater econometric modelling:** Ofwat has gone against its modelling principles by including "Load treated in size bands 1 to 3 (%)" as an explanatory variable for economies of scale in the sewage treatment econometric model within the wastewater modelling suite. This is despite this variable failing modelling robustness tests and being weaker from an engineering perspective than the continuous Weighted Average Treatment Size (WATS) variable due to its discrete nature. Correcting this error by dropping this explanatory variable and instead relying on more statistically robust models with greater engineering rationale that use the continuous WATS variable, which draws out the

differences in unit cost within the discrete size bands (which are significant), increases our allowance by £41m.

- **Error 2: Water econometric modelling:** Ofwat has similarly gone against its modelling principles by including "Average pumping head (APH)" as an explanatory variable in its water models despite the data for this variable not being of good data quality. Correcting this error by dropping this variable and instead relying on models that use the booster pumping variable, which was introduced by Ofwat as an explanatory variable in PR19 it is not affected by data quality issues, increases our allowance by £53m.

19. Ofwat has rejected most of our CACs, by applying an acceptance criterion which is heavily skewed towards rejecting claims:

- **Error 3: Rejecting advanced anaerobic digestion CAC:** Ofwat has rejected our CAC to fund the advanced anaerobic digestion (**AAD**) upgrade needed at two sludge treatment centres. Ofwat considers the bioresources base cost allowance to be sufficient to fund these upgrades. This assessment is inconsistent with the precedent that was set in allowing Thames Water a separate allowance for a similar bioresources scheme, and is in any event wrong as it fails to have regard to the fact that other companies' comparable AAD upgrades were funded historically separately from the base allowance. Correcting this error increases our bioresources base cost allowance by £101m.

- **Error 4: Rejecting regional labour cost CAC:** Ofwat has rejected our regional labour cost CAC. Our location in the South East of England, particularly close to London, places us in a region with significantly higher wages than the national average. The role of regional labour costs in driving expenditure is well recognised in the energy sector and we have conducted similar analysis to evidence the additional costs we face. Correcting this error, by including a median wage index as a driver in the econometric model, increases our water and wastewater base cost allowances by £73m and £85m respectively.

- **Error 5: Rejecting our coastal population CAC:** Despite accepting our engineering rationale supporting higher costs for coastal wastewater sites, Ofwat concluded that its own unit cost analysis gave inconclusive results across the sector. It therefore rejected our coastal population CAC. There are methodological flaws in Ofwat's assessment and correcting for these shows that the unit cost for coastal sites across the sector is 41% higher than inland sites across the sector. This differential is supportive of the 43% cost differential we identified for our sites over the entire AMP. The bottom-up unit cost analysis is supported by econometric evidence that a coastal variable exerts a perceptible, significant and logical influence on wastewater treatment costs. Correcting this error, by including this coastal population variable in the econometric model, increases our wastewater base cost allowance by £126m.

20. Finally, Ofwat has made errors in the out-of-model adjustments carried out, in addition to not making a necessary adjustment for a critical under-funded area:

- **Error 6: Over-optimistic frontier shift:** The FD includes a year-on-year efficiency improvement (**'frontier shift**') that Ofwat assumes for the water sector during each AMP. Ofwat assumes a 1% frontier shift, in line with the most efficient high-tech sectors in the UK economy. This is despite the water sector historically not achieving efficiency anywhere near this level. Between 1995 and 2019, only 14 out of 46 sectors in the UK had productivity

growth of 1% or more. Adopting a more realistic 0.5% frontier shift would increase our cost allowance by £125m.

- **Error 7: Unrealistic assumptions around power cost share and forecast energy prices:** Ofwat made an out-of-model adjustment to account for the recent energy price increases and future uncertainty around the future price. Ofwat models each company's power costs based on the most recent five years. This contrasts with how Ofwat normally uses the entire modelling period of 13 years (i.e. from 2011/12) to account for the cyclical nature of this cost. In comparison to the rest of the sector that experienced higher recent energy costs, we are uniquely negatively impacted by this assumption due to our favourable recent hedging position. Ofwat also sets an unrealistic glide path for future energy prices, beyond the reduction assumed by Government forecasts. This creates immediate cashflow risks for us and unnecessary bill shocks for customers. Correcting for these issues, by modelling costs over a longer period and using a more justifiable glide path, increases our allowance by £47m.

- **Error 8: Lack of urgency around asset health under-funding:** Ofwat has recognised the difficulty of assessing capital maintenance requirements going forward. However, despite the clear recommendation at the CMA PR19 Redetermination, Ofwat has not enhanced its approach to capital maintenance with a forward-looking element. According to our analysis, we have been under-funded by £585m across the wholesale water asset base from 2005 to 2025. Ofwat is only now seeking to better understand the sector's asset health position to enable it to potentially make further sector-wide adjustments at a later point. This approach lacks definition, clarity and urgency, whereas the evidence strongly points to systematic under-funding across multiple AMPs and a need for additional funding in AMP8. We require a gated allowance of up to £500m that can be accessed when evidence of specific asset health requirements is presented.

2.2. Impacts

21. Each of the errors we identify individually represents a significant shortfall in funding for essential areas of our work. Together the under-funding represents a substantial gap which cannot be accommodated within the framework of the price control:

Table 2: Impacts from FD errors related to base costs

Error	Impact (£m, 2022/23)
Error 1: Wastewater econometric modelling	£41m
Error 2: Water econometric modelling	£53m
Error 3: Rejecting advanced anaerobic digestion CAC	£101m
Error 4: Rejecting regional labour cost CAC	£158m
Error 5: Rejecting our coastal population CAC	£126m
Error 6: Over-optimistic Frontier shift	£125m
Error 7: Unrealistic assumptions around power cost share and forecast energy prices	£47m
Error 8: Lack of urgency around asset health under-funding	Gated Allowance

Note: The remedy for Error 6 includes a £66m increase related to base costs and £59m related to enhancement costs.

2.3. Remedies

22. We ask the CMA to consider the analysis presented against each of the FD's analytical approaches taken to assess base costs, and to grant the additional allowances sought by Southern Water we are requesting in the case of errors 1 to 7.

23. As regards error 8, we require immediate action on asset health through a gated allowance that can be accessed as evidence of specific asset issues is presented.

3. Enhancement – Cost assessment

24. Enhancements are improvements to assets and services to meet new standards or statutory requirements as well as activities to provide services to new customers. There is a step change in enhancement investment required for AMP8. **The FD cost allowance for the PR24 enhancement programme is over five times the allowance for the PR19 (AMP7) enhancement programme**. Most enhancement projects are driven by environmental statutory and regulatory requirements.

3.1. Errors

25. We were asked by Ofwat to provide fully costed project assessments. We are disappointed that in so many instances, Ofwat did not engage with the data that was requested and rather applied abbreviated or arbitrary assessments which resulted in significant funding shortfalls or misallocation of enhancement funding to base costs – without any substantive engagement with or rebuttal of the evidence provided.

26. The resulting level of the funding shortfall is approximately £300m. This is a material amount that cannot simply be accommodated by squeezing our base costs harder. £300 million is equivalent to 8% of Ofwat's allowed base funding for all water, wastewater and bioresources services.

Table 3: Cost deductions included in this enhancement case

Ofwat error	Enhancement category	Schemes / Programmes	Impact £m gap
Error 1: Setting cost allowances based on weakly performing top-down models that have not accounted for the full complexities of our enhancement programme	Water supply interconnectors	1. Hampshire Grid – Andover Link Main 2. Hampshire Grid – Southampton Link Main	20.2
	Bioresources Industrial Emissions Directive	1. Secondary containment at all 16 sites requiring IED improvements 2. "Other IED" costs relating to all 16 sites	33.6
Error 2: Applying arbitrary top-down challenges without sufficiently engaging with our bottom-up costs.	WINEP flow monitoring at sewage treatment works	All 254 treatment works with AMP8 WINEP requirements for flow monitoring improvements	21.0
	WINEP monitoring at emergency overflows	All 251 emergency overflow sites in the AMP8 WINEP requirements to install Event Duration Monitoring and flow monitoring.	27.9
	WINEP - Water	All investments required to address statutory requirements: 1. Invasive non-native species (£5.0m) 2. Drinking water protected areas (£22.8m) 3. Water Framework Directive (£8.2m)	3.6
	Wastewater shallow dives	All investments required to address statutory requirements: 1. Event Duration Monitoring (£8.3m) 2. Nature based solutions for sanitary parameters and P removal at 3 sites (£13.5m) 3. Microbiological treatment at 6 sites (£40.7m) 4. Budds Farm Havant SSO storm overflow scheme (£48m)	10.2[2]
Error 3: Incorrectly reallocating enhancement expenditure to base or incorrectly determining that enhancement expenditure has been funded previously	Mains replacement	Programme of 366km of mains replacement, 66km of which target asset health and 300km target leakage reduction.	106.8
	Water resilience	1. [redacted] WSW transition funding 2. [redacted] WSW transition funding 3. Weir Wood WSW transition funding	59.7
	Water supply scheme	Smock Alley	21.3
	Total		**304.3**

27. The FD provides inadequate enhancement allowances for a number of schemes by reason of:

- **Error 1: Setting cost allowances based on weakly performing top-down models that have not accounted for the full complexities of our enhancement programme:** For the purposes of the FD, Ofwat determined material enhancement allowances by reference to top-down econometric models or following deep or shallow dive assessment.

  For water supply interconnectors and Industrial Emissions Directive schemes, Ofwat relied on top-down econometric models to determine the enhancement allowance. In both cases, the models are inappropriate. They did not take into account material factors that drive differences in costs, were not statistically robust and not a credible method for assessing costs for essential and complex investment activities.

  This is not a casual technicality. The shortfall in funding caused by these incorrect modelling amounts is material, where project costing was provided to Ofwat, which evidenced that our costs are efficient.

- **Error 2: Applying arbitrary top-down challenges without sufficiently engaging with our bottom-up costs:** Where Ofwat has not used econometric models to determine the enhancement allowance, it applied reductions to our requested allowances following a 'deep dive' or a 'shallow dive' assessment. In many instances, the reductions are arbitrary. For example, for a statutory monitoring programme Ofwat applied a 30% reduction to our costs

[2] This value includes a £5.4 million reduction from Ofwat's shallow dive assessments on EDM Monitoring, NTAL Monitoring, Nature-Based Solutions, Microbiological Treatment, and Fish Screens, plus a £4.8 million cut from its assessment of our Budds Farm storm overflows scheme, which applied a 10% "company level efficiency challenge". While not explicitly labelled a shallow dive, this approach aligns with the method and is treated as such.

on the basis it had "significant concerns". Ofwat has not considered sufficiently the evidence we provided as to scheme scope and costs; and

- **Error 3: Incorrectly reallocating enhancement expenditure to base (i.e., proceeding on the basis that the scheme is funded by base allowances) or incorrectly determining that enhancement expenditure has been funded previously:** Ofwat has incorrectly reallocated a significant proportion of our requested enhancement allowance to base costs. One example is Ofwat's assumption that we will undertake a considerable volume of mains renewal activity, beyond what is the historical industry level, funded through our base cost allowance. We propose an extensive mains renewal enhancement programme aimed at reducing leakage. Overall, Ofwat disallowed £188 million of water enhancement costs on the basis that Ofwat considers we are implicitly funded for these activities through base cost allowances. £188 million is equivalent to a further 23% efficiency challenge to our modelled wholesale water base cost allowance. We cannot absorb the cost of these additional activities, particularly when our base cost allowance is itself inadequate (see the section above).

3.2. Impacts

28. This results in an enhancement cost allowance that is materially short of the allowance we require to deliver the mandated outputs.

29. We have reviewed Ofwat's FD and present scheme specific, material cases for Ofwat's decisions to be overturned. In total, we are seeking a re-determination that must include an additional £304 million in enhancement funding.

30. Other components of our enhancement shortfall relate to schemes and areas where the cost gap is less material than in the nine cases listed above in Table 3. Typically, the shortfall in such schemes and programmes arises from the application by Ofwat of the same flawed approaches described below with respect to the cases for which we are requesting a redetermination. While we are not presently requesting that the CMA makes a redetermination in relation to such schemes and areas, to the extent that the CMA's investigation extends more widely into Ofwat's approach to enhancements (e.g. at the request of another Disputing Company), we reserve the right to make further submissions to the CMA in respect of such matters.

3.3. Remedies

31. We provided fully costed project assessments to Ofwat in our business plan. We ask the CMA to engage with our assessments and to award the necessary funding. The remedies we recommend result in an addition of £287 million to our cost allowance compared to Ofwat's FD. The specific enhancements we are asking the CMA to remedy are set out in the table above.

4. Uncertainty mechanisms

32. AMP8 involves a step change in investment, including many schemes with limited track record for delivery in the UK water sector. In many cases, new requirements were confirmed after the submission of our business plan, with further updates being provided to Ofwat throughout the course of 2024. Given the unprecedented scale of investment (for Southern Water, the PR24 enhancement programme is over five times our AMP7 enhancement allowance), with many bespoke projects being at relatively early stages of the project development lifecycle, a much greater use of uncertainty mechanisms is required than used the past.

33. The purpose of uncertainty mechanisms is to protect both customers and companies from material changes in circumstances, such as major changes to project scope / requirements – either through changes in the external environment, or through the company developing a better understanding of the required costs as estimates mature from early stage projections. Where costs decrease as a result of such changes, customers should not be made to pay for the outdated scope estimates – conversely, if scope increases due to factors largely outside of company control, cost allowances need to increase so that revenues reflect the requirements the company faces. Some of the mechanisms set out in the FD meet this objective, while others require modification in order to function appropriately.

4.1. Errors

34. We identify the following errors in the FD:

- **Error 1: Designing a Delivery Mechanism that hinders delivery:** Ofwat has set a **Delivery Mechanism** for only Southern Water and Thames Water. For a pre-specified list of schemes, Ofwat will release funding only once the company has demonstrated to Ofwat's satisfaction that the company can deliver the schemes. The funding levels have been set as part of the FD – i.e., there is no scope to make the case for updated levels of funding should the need arise due to better information.

  Rather than supporting delivery of our investment programme, the delivery mechanism specified in the FD hinders delivery by creating a strong incentive for the company not to progress with the schemes in question in order to avoid a material mismatch between expenditure and funding allowances.

  The mechanism exposes Southern Water to material (up to £553 million) unremunerated downside risk, and does not give the company any ability to appeal future funding decisions made by Ofwat pursuant to a novel and as yet untested approach.

- **Error 2a: Not allocating uncertain schemes into the Large Scheme Gated Process:** Ofwat has established a **Large Scheme Gated Process**, whereby projects with a material level of uncertainty in their costs are required to make additional submissions during the control period, with cost allowances being adjusted for any differences to the revised agreed view of efficient costs to deliver the scoped scheme as compared to the original development allowances. Ofwat has allocated two out of five sites sat within our 'Five Site Strategy' to this process. The schemes that have not been allocated also carry a high degree of uncertainty due to their novel nature and early stages of development.

All five schemes within our programme should fall under the uncertainty mechanism reflecting the uncertainty present and the fact they are a single programme of works.

- **Error 2b: Preventing a suitable project from being considered within Ofwat's DPC framework:** For large standalone projects, there is a regulatory framework (**direct procurement for customers** – **DPC**) that enables third parties to finance, build, own, and operate the assets. For certain types of projects, this can deliver customer benefits. The DPC framework also acts as a form of uncertainty mechanism, as cost allowances are set after the third party has bid to construct the project. Basing cost allowances on these market bids helps ensure that customers pay the efficient costs of large scheme delivery. Ofwat has omitted the Bioresources project from the DPC process due to a general position of excluding these types of assets from the mechanism. However, we have identified a compelling case for their inclusion. Our Bioresources project should be included in the DPC process as doing so would give rise to at least £12 million better value for money for customers, as well as supporting the deliverability and financeability of our overall programme.

- **Error 3: Not fully defining notified items threshold:** For a specified list of areas (notified items), there is the option for revenues to be re-opened mid-period providing certain conditions are met. This includes cost increases exceeding a certain threshold. A threshold of 10% of revenues is set out in the licence. In the FD, Ofwat suggested that it may consult on lowering this threshold to ('at most') 2%. We agree that this is required. However, at the time of companies having to decide whether to accept the FD or trigger a redetermination by the CMA, this threshold change has not been confirmed, thus exposing us to an addition >£100 million risk.

- **Error 4: Failing to set an uncertainty mechanism for metering boundary box replacements:** In our business plan, we proposed an uncertainty mechanism relating to the volume of **metering boundary box replacements** that will need to be undertaken during AMP8. This was not included in the FD despite the fact that the volume required is highly uncertain, outside of company control, and has the potential to significantly impact our cost requirements. Based on data gained from other companies, the impact could be as much as £180 million.

4.2. Impacts

35. Each of the errors result in a material impact on Southern Water, as shown in the table below:

Table 4: Impacts of the errors connected to uncertainty mechanisms

Error	£m impact
Error 1: Designing a Delivery Mechanism that hinders delivery	£533m
Error 2a: Not allocating uncertain schemes into the Large Scheme Gated Process	Uncertain
Error 2b: Preventing a suitable project from being considered within Ofwat's DPC framework	£12m + other benefits
Error 3: Not fully defining notified items threshold	>£100m
Error 4: Failing to set an uncertainty mechanism for metering boundary box replacements	**c.£180m**

4.3. Remedies

36. We ask the CMA to:

- Re-specify the delivery mechanism as a notified item, so costs can be updated based on the latest available information during the control period and for the assessment to be subject to the standard appeals process if required;
- Allocate the entire of our 'Five Site Strategy' programme to the large scheme gated process, so that cost allowances can be adjusted up or down during the control period as improved information becomes available;
- Allocate the Bioresources project to the DPC process to realise benefits to customers;
- Reduce the notified item materiality threshold to 2% (as per Ofwat's stated, but as yet undelivered policy position); and
- Specify the uncertainty associated with meter boundary box replacement as a notified item.

5. Price Control Deliverables

37. Ofwat introduced price control deliverables (**PCDs**) as a new mechanism for PR24. The PCD framework prescribes deliverables for each company, predominantly in the form of outputs. Most PCDs relate to enhancement expenditure but some relate to base.

38. We agree that it is in customers' interests to require companies to refund enhancement allowances for projects which companies do not ultimately deliver. However, we have significant concerns with the design of the PCD framework in the FD.

5.1. Errors

- **Error 1: The framework is excessively punitive and inflexible:** it requires a company to repay an allowance where the relevant output is not delivered on time, notwithstanding that the company may be well advanced in their delivery of the output. It fails to recognise that reasons for delay or non-delivery may be beyond the company's control and that delays may not have a material impact on customer outcomes. It imposes prescriptive output-based deliverables, with no general mechanism to permit changes to outputs or delivery dates;
- **Error 2: The design of the PCD framework introduces deliverability risk, creating significant RoRE downside skew** on a notional company basis and, even more significantly, on a Southern Water-like notional company basis;
- **Error 3: The imposition of PCDs on base expenditure is distortive:** by ring-fencing a significant proportion of botex allowances for PCD deliverables, the remaining botex allowance is not sufficient to enable the company to maintain a base level of service to customers. Ring-fencing removes the flexibility that companies need to redirect expenditure most effectively to deliver outcomes and benefits;

- **Error 4: The outputs-focussed PCD framework conflicts with the aims of the existing outcomes-based regulatory approach:** Its design risks creating perverse incentives by discouraging efficiency and innovation; and

- **Error 5: The PCD framework creates a risk of overlapping penalties:** Failure to deliver a PCD output may additionally lead to ODI penalties and/or financial penalties arising out of enforcement action for non-compliance with statutory or regulatory obligations.

5.2. Impacts

39. The PCD framework in the FD creates significant deliverability risk for a notionally efficient company operating in the Southern Water region. On a P50 basis, the enhancement PCD risk has a negative value in excess of £58 million across AMP8 (base PCD risk has not been quantified financially at this stage).

5.3. Remedies

40. We believe that a redesign of the PCD framework is required so that it delivers for customers while not giving rise to disproportionate risk for companies. We ask the CMA to determine a PCD framework with features which include:

- **A true non-delivery PCD mechanism:** which is limited to cases where companies fail to commence or otherwise cancel the delivery of the output. It would not be triggered where delivery is delayed;

- **A two-way time incentive PCD:** under which a late delivery penalty would apply where companies fail to deliver outputs by the prescribed delivery date. A reward would be available for early delivery. (A within-AMP time-incentive penalty is not appropriate given the limitations it would impose on company's ability to manage its capital programme);

- **A within-AMP adjustment mechanism:** under which a company may request Ofwat to modify a PCD in respect of outputs and/or delivery dates so as to reflect certain within-AMP developments;

- **An offset mechanism:** to address the financial double penalty associated with overlaps between PCDs and ODIs. The PCD penalty would be reduced by an amount equal to any ODI payment associated with a failure to deliver the relevant PCD output; and

41. **Modifications to the specification of base expenditure PCDs for mains renewal and network reinforcement:** to ensure that the PCDs apply only to activities funded by specific cost adjustments made by Ofwat in the FD (and not to activities funded by the implicit allowance).

6. Performance Commitments and Outcome Delivery Incentives

42. Performance Commitments (**PCs**) are the measures defined by Ofwat to assess water company performance and deliver outcomes. Performance Commitment Levels (**PCLs**) are the specific targets that Ofwat sets for each PC that it expects companies to deliver. Most PCs are linked to an Outcome Delivery Incentive (**ODI**), which provides financial penalties for under-performance and rewards for out-performance, in each case relative to the PCL.

43. We have identified significant errors in how Ofwat has calibrated our PCLs and ODIs. Ofwat's failure to capture company specific risk factors in its calibration of PCs and ODIs disproportionately exposes us to outsized risk.

6.1. Errors

44. At PR19, Ofwat adopted a marginal benefits-based approach to setting ODI rates. Ofwat aimed to improve upon this in PR24 and set ODIs directly from customer research they ran themselves on behalf of the industry. However, mid-way through the PR24 process Ofwat abandoned this and moved to a 'top-down' framework[3]. This change meant that companies were not able to factor in the needs and priorities of their own customers in determining ODI rates. Ofwat's methodology also led to unjustified changes in incentive rates compared with those set at PR19.

45. The FD PC/ODIs package a number of overarching errors as follows:

- **Error 1: RoRE risk exposure with a large downward skew:** The FD's ODI package, as well as Ofwat's overall approach to the PCs and ODIs framework are skewed towards penalties. This is set out further in Chapter 1 (Risk and Financeability), where the P50 for a notional company like Southern Water is -0.50% of RoRE, with unrealistic performance expectations and disproportionately high penalty rates. These do not represent a "fair bet", or a reasonable incentive on the company to succeed. This error applies to all 12 PCs outlined below;

- **Error 2: Exogenous factors:** Ofwat has not considered exogenous factors (i.e. extreme weather events, unique geographical characteristics) and incidents beyond management control when setting ODIs and PCLs. Again, this would likely result in penalties that the company could little to change. This is inconsistent with past regulatory precedents and other sectors where fair and achievable incentives have been set; this error applies to 8 out of 12 PCs outlined below;

- **Error 3: Calibration:** In the FD, there are several specific calibration errors which will have a negative impact on our business. They centre around the following areas: ODI rates, PCLs, caps, collars, deadbands and overall risk mitigation measures (i.e. ASM and OAM); this error applies to all 12 PCs outlined below; and

- **Error 4: The fundamentals of Southern Water are different from other companies**: Applying a national policy in some PCLs/ODIs would result in unjust penalty due to company

[3] Ofwat, August 2023, PR24: Using collaborative customer research to set outcome delivery incentive rates, page 3, SOC-66-0001.

specific factors, where Southern Water is different from other companies, by its fundamental characteristics. This error applies to 2 out of the 12 PCs outlined below.

46. We then identify 12 PCs where significant correction is needed due to these overarching errors having a material impact.

47. In addition, Ofwat has made specific errors in respect of its setting PCLs, ODIs and/or risk mitigation measures for:

- Water Supply interruptions (**WSI**);
- Compliance Risk Index (**CRI**);
- Total Pollution Incidents;
- Serious Pollution Incidents;
- Storm Overflows; and
- the measures of experience (**C-Mex**, **D-Mex** and **BR-Mex**).

48. In addition, Ofwat has not addressed the downward risk exposure inherent in our outcomes package due to the absence of risk protection. We propose to introduce or tighten further collars on the following PCs to mitigate this risk:

- Bathing Water Quality;
- Leakage;
- Water Quality Contacts; and
- Discharge Permit Compliance.

49. Finally, Ofwat has applied a deadband to its Outturn Adjustment Mechanism (OAM) of +/-50bps, this undermines the intent of the OAM to balance the package of ODIs.

6.2. Impact and remedies

50. Ofwat should remove the deadband on the OAM to ensure it fully mitigates sector wide and delivers a balanced risk and reward package for ODIs. Given the significant number of overarching errors identified in the setting of Southern Water's PCLs and ODIs, we outline in the table below, both the impacts and the specific suggested remedies to solve for the errors. The impacts are defined by a reduction in P10 and/or P50 risk through a combination of incentive rate changes, PCL changes and tightening the collars.

51. The PC/ODI framework in the FD creates significant risk for a notionally efficient company operating in the Southern Water region. Solving the errors we are proposing significantly reduces this risk by c.£247m and creates a much more balanced package for the PC/ODI framework.

Table 5: Summary of the identified errors and remedies for each PC

PC	Driver	Error	Remedy	Impact (£m)
Water PCs				
Water Supply interruptions (**WSI**)	RoRE risk, exogenous factors, calibration error	ODI rate, PCL and risk mitigation (collar)	• Change ODI rate to 0.329 • Change PCL to 00:09:18 for 25/26 with a glidepath of equal increments down to 00:05:32 in 29/30 • Tighten collar to -0.5% RoRE	£27.3m
Compliance Risk Index (**CRI**)	RoRE risk, Calibration error	Risk mitigation (deadband and collar)	• Change deadband to 3.33 for 25/26 with a glidepath to 2.00 in 29/30 • Introduce -0.5% RoRE collar	£7.8m
Wastewater PCs				
Total Pollution incidents	RoRE risk, calibration error, exogenous factors and fundamentals of Southern Water	ODI rate and PCL	• Change ODI rate to 0.379 • Change PCL level to 30.59 in 25/26 with glidepath down to 22.78 in 29/30	£60.6m
Serious Pollution incidents	RoRE risk, calibration error, exogenous factors and fundamentals of Southern Water	Risk mitigation (collar)	• Introduce -0.5% RoRE Collar	£17.6m
Storm Overflows*	RoRE risk, calibration error, and exogenous factors	ODI rate and PCL	• Change PCL to 20.45 in 25/26 to 17.27 in 29/30 • Change ODI rate to 0.393 • +/-0.25% RoRE cap/collar	£17.7m
Retail measures				
C-MeX	RoRE risk, calibration error	ODI rate and PCL	• Recalibrate PCL using a downward adjustment of 6 in 25/26-27/28 and 7 in 28/29-29/30 • Change ODI rate to 0.431	£48.8m
D-MeX	RoRE risk, calibration error	ODI rate	• Change ODI rate to 0.134	£27.3m
BR-MeX*	RoRE risk, Calibration error	ODI rate	• Change ODI rate to a maximum of 0.1% of RoRE	£1.3m
Other				
Downward exposure (Leakage, Water Quality Contacts, Discharge Permit Compliance and Bathing Water Quality*)	RoRE risk, calibration error, exogenous factors	Risk mitigation (collars)	• Leakage: Introduce -0.5% RoRE collar • WQC: Introduce -0.5% RoRE collar • DPC: Introduce -0.5% RoRE collar • BWQ: tighten cap/collar to +/-0.25% RoRE	£39.1m

The above is based on KPMG's risk modelling for a notional company, such as SRN, unless stated otherwise. This approach aligns with the methodology outlined in Chapter 1 (Risk and Financeability) chapter.

*not modelled under the notional scenario given lack of historical data, we use alternative scenario analysis to derive £m impact

7. Cost of capital

52. The cost of capital (weighted average cost of capital or 'WACC') is the return that we are allowed (expressed as a percentage of our regulatory capital value or 'RCV'). It comprises both an allowed return on equity and debt. The cost of capital is critical at AMP8 to attract the investment we need to deliver a resilient water service for our customers.

53. PR24 is fundamentally different to PR19. We must compete for unprecedented levels of new capital at a time where investor sentiment towards our sector is at an all-time low and competition for capital across infrastructure sectors has strongly intensified. We face a step-change in risk and interest rates are expected to stay 'higher for longer'. These factors underscore the need for a financeable allowed return and mean the financeable allowed return for AMP8 must be above that in previous AMPs.

54. Our capital programme is larger and more complex than that of other companies due to the specific characteristics of our local region. This means that our plan for AMP8 is risker than for other companies which underscores our need for a financeable allowed return. Further, we are a company in turnaround and an unfinanceable allowed return will weaken our ability to achieve a successful turnaround at the pace we want and our customers expect.

55. Ofwat has a statutory duty (s.2(2A)(c) of the Water Industry Act 1991) to secure that companies are able (in particular, by securing reasonable returns on their capital) to finance the proper carrying out of their functions. The CMA must make its determination in accordance with Ofwat's finance and other duties. Setting a financeable allowed return is essential to ensuring compliance with this duty.

7.1 Errors

Error 1: The allowed return on equity fails market tests

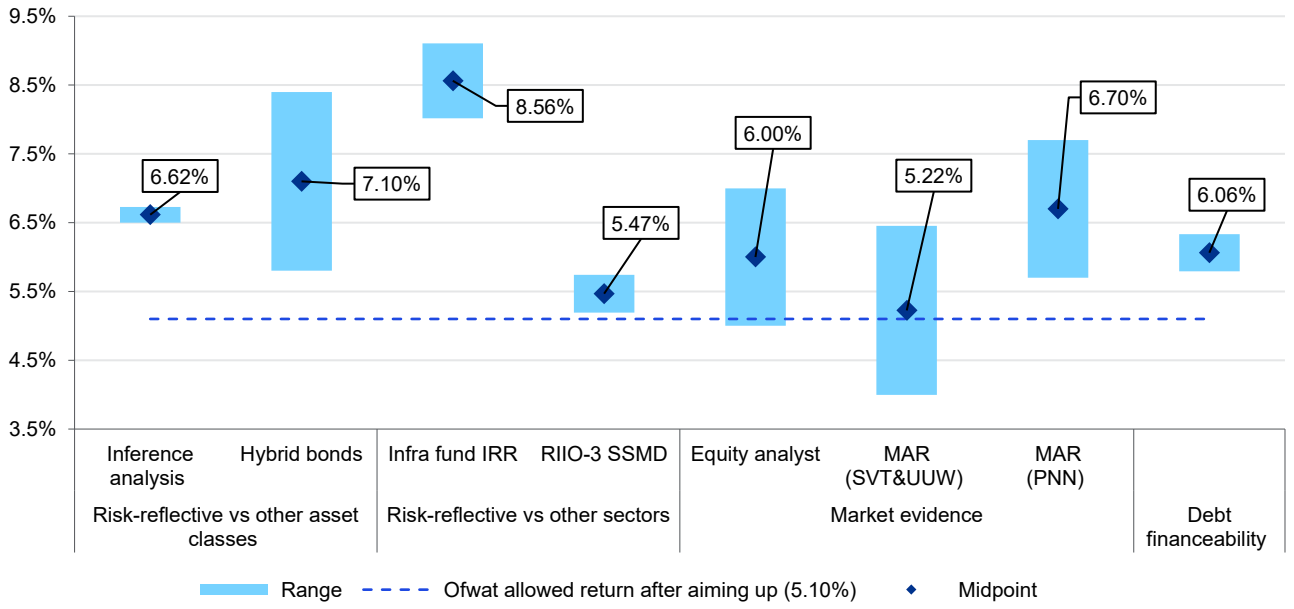
56. Market tests show that Ofwat's allowed return on equity does not:

- **Risk-reflective vs other asset classes:** Provide an appropriate equity risk premium for water equity over water debt. The difference between the allowed return and the cost of new debt for water companies is at an all-time low. This means there is a low incentive for investors to invest in higher-risk water equity over water debt;
- **Risk-reflective vs other sectors:** Provide an equity return that is comparable to other sectors of comparable risk. The allowed return is below that Ofgem has set for energy in the RIIO-3 Sector Specific Methodology Decision, and infrastructure fund equity internal rates of return. This means there is a low incentive for investor to commit capital to water as there are higher returns available in other sectors for lower (energy) or comparable (wider infrastructure) sectors;
- **Market evidence:** Provide an equity return that is consistent with market evidence, including Ofwat's own cross-check. Ofwat's market-to-asset ratio (**MAR**) analysis clearly shows that its allowed return is (1) below the midpoint of the MAR-implied cost of equity across the listed water companies (Severn Trent, United Utilities and Pennon); and (2) is below the entire range of the MAR-implied cost of equity for Pennon which is more representative of the notional company than Severn Trent / United Utilities; and

- **Debt financeability:** Secure debt financeability for a notional company with our specific characteristics. Our financeability assessment shows that a notional company with our specific characteristics cannot achieve the notional rating of Baa1/BBB+. The CMA in its PR19 Redetermination relied heavily on debt financeability to assess the sufficiency of its allowed return on equity.

57. The comparison between the allowed return and these market tests is shown in the chart below.

Figure 1: Ofwat allowed return after aiming up vs market tests (CPIH-real, 55% gearing, excl. RMA)



Source: Southern Water analysis based on KPMG and Frontier Economics reports.

58. Ofwat's allowed return on equity fails these tests because it has (1) not reflected the changes in risk for the sector since PR19; and (2) made a series of technical errors in its estimation of the cost of equity parameters. These errors are covered in the error below.

Error 2: The allowed return on equity is based on erroneous parameter estimates

59. The errors across Ofwat's estimates of the cost of equity parameters are as follows:

- **Risk free rate:** The risk-free rate does not reflect that (1) investors' risk-free borrowing rate is higher than their risk-free saving rate; and (2) index-linked gilts benefit from the convenience yield which depresses their yield below the risk-free saving rate;

- **Total market return:** The total market return: (1) places weight on historical ex-ante estimates instead of placing sole weight on more reliable historical ex-post estimates; and (2) is based on historical ex-post estimates which assume serial correlation is present and only the investor perspective is relevant;

- **Beta:** The beta: (1) does not place weight on Pennon's beta which is more representative of the notional company and is higher than Severn Trent / United Utilities; (2) places excessive

weight on periods in which large sections of the economy were shut and thus assumes such periods reoccur in AMP8; and (3) does not reflect the expected increase in risk for AMP8, particularly under our plan, and instead implies risk has reduced relative to AMP7;

- **Aiming up excluding for asymmetry:** The aiming up: (1) does not meet Ofwat's intention of ensuring that the allowed return can attract investment rather it serves to partially offset the downward bias in selection of estimates for the parameters above; (2) implies a cost of equity that is below its one and only cross-check, the MAR; and (3) based on a wider suite of cross-check evidence (such as alternative asset pricing models to the Capital Asset Pricing Model and debt financeability) supports a higher adjustment;
- **Aiming up for asymmetry:** The aiming up does not factor in downside asymmetric risk in equity returns for a notional company with our specific characteristics. This means that investors do not face a fair bet. Investors will not commit new equity capital where they do not face a fair bet; and

- **Retail margin adjustment:** The retail margin adjustment: (1) does not reflect that the retail business is integrated with the wholesale business and therefore should be financed with equity to avoid appointee gearing increasing above the notional level. At a minimum, the retail business should be financed at the appointee WACC; and (2) accounts for the revenue on DPC and SIPR assets but not the cost of financing these fixed assets.

Error 3: The allowed return on debt does not reflect the sector average company's actual debt costs

60. Ofwat's policy on debt is that the sector average company is the proxy for the notional company. Ofwat's allowed return on debt does not allow the sector average company to recover its efficient debt costs.

61. This is a result of the following technical errors:

- **Cost of embedded debt:** The cost of embedded debt: (1) places weight on the 'actual-notional' cost rather than sole weight on the 'all-in' cost. As sole weight is not placed on the 'all-in' cost, the allowance underfunds the sector average company's actual cost of embedded debt; and (2) is based on an 'all-in' cost that excludes swaps even though swaps are actively used by the sector for efficient purposes;

- **Cost of new debt:** The cost of new debt: (1) is based on secondary market analysis of Baa1/BBB+ water bonds but this analysis does not control for tenor; and (2) assumes that the notional company can achieve a Baa1/BBB+ rating but in practice the notional company is likely to be closer to Baa2/BBB; and

- **Share of new debt:** The share of new debt is based on a calculation that contains errors, outdated data and internal inconsistencies. This results in a share of new debt below that for the sector average company.

Error 4: The allowed return on debt fails to take account of factors outside of company control

62. Ofwat's allowed return on debt does not reflect factors outside of company control across the cost of debt parameters below:

- **Cost of embedded debt:** The cost of embedded debt assumes that the gap between an individual company's actual cost and the allowance is solely due to management inefficiency. In practice, an individual company's actual cost is driven by a range of factors that are not completely within management control. As such, it is wrong to allocate 100% of the risk between allowance and actual costs to companies;

- **Share of new debt:** We have a capital programme that is the largest in the sector in terms of RCV growth. This is outside of our control and as such, our share of new debt should reflect our company-specific RCV growth. Instead, our share of new debt is based on the RCV growth of the sector average company;

  As the cost of new debt is higher than the cost of embedded debt, an understated share of new debt will underfund our new debt. This disincentives us from investing as not investing limits our requirement for new debt and thus our level of underfunding;

- **Basis risk:** Ofwat has implemented a full transition to the CPIH inflation index which introduces additional financing risk and cost for companies. Ofwat has not provided an allowance to manage these additional risk/costs even though its decision was outside of company control. Relatedly, this contravenes Ofwat's own commitment to implement the transition to CPIH in a neutral manner;

- **Cost of carry:** The cost of carry (1) does not reflect prefinancing for maturing debt; (2) assumes that the RCF is available only to support prefinancing and not unforeseen circumstances; and (3) does not reflect forward-looking expectations of interest rates; and

- **Liquidity cost:** The liquidity cost is based on inputs from the DD rather than the FD.

Error 5: The reduction to notional gearing is not supported by evidence

63. Ofwat's has reduced notional gearing from 60% to 55%. This is in error because:

- Ofwat has increased business risk for the notional company but sought to offset the impact of this on the notional company's financial resilience by reducing its gearing. This does not reduce risk at the enterprise level. It merely transfers risk from debt to equity and could instead worsen risk at the enterprise level as ODI exposure increases mechanistically in proportion to the quantum of regulated equity;

- Ofwat places weight on actual debt costs to estimate the allowed return on debt. To maintain consistency across the allowed WACC, Ofwat should place weight on actual gearing levels to estimate notional gearing. All companies are geared above 55% and the sector average is 68.9%; and

- The rating agency methodologies for Fitch and Moody's place weight and consider independently metrics for gearing and coverage. 60% gearing typically implies a Moody's and Fitch rating of A3/A-. This suggests that gearing is not a constraint for the notional company.

7.2 Impacts

64. In sum, the allowed return on equity fails market tests and the allowed return on debt does not provide for efficient debt costs.

65. The consequence is that there is a low incentive for investors to allocate new capital to the water sector. This means that the allowed return is not financeable and therefore Ofwat has not met its finance duty.

66. An unfinanceable allowed return:

- Creates harmful outcomes for customers as recognised by the CMA in its PR19 Redetermination. In the short-term, it could jeopardise the sector's ability to secure the investment needed to upgrade its asset resilience and service levels. In the long-term, it will drive a higher required WACC. It is particularly harmful for our customers due to the scale of the capital programme required in our plan, in addition to which it may undo the progress and momentum on our turnaround; and

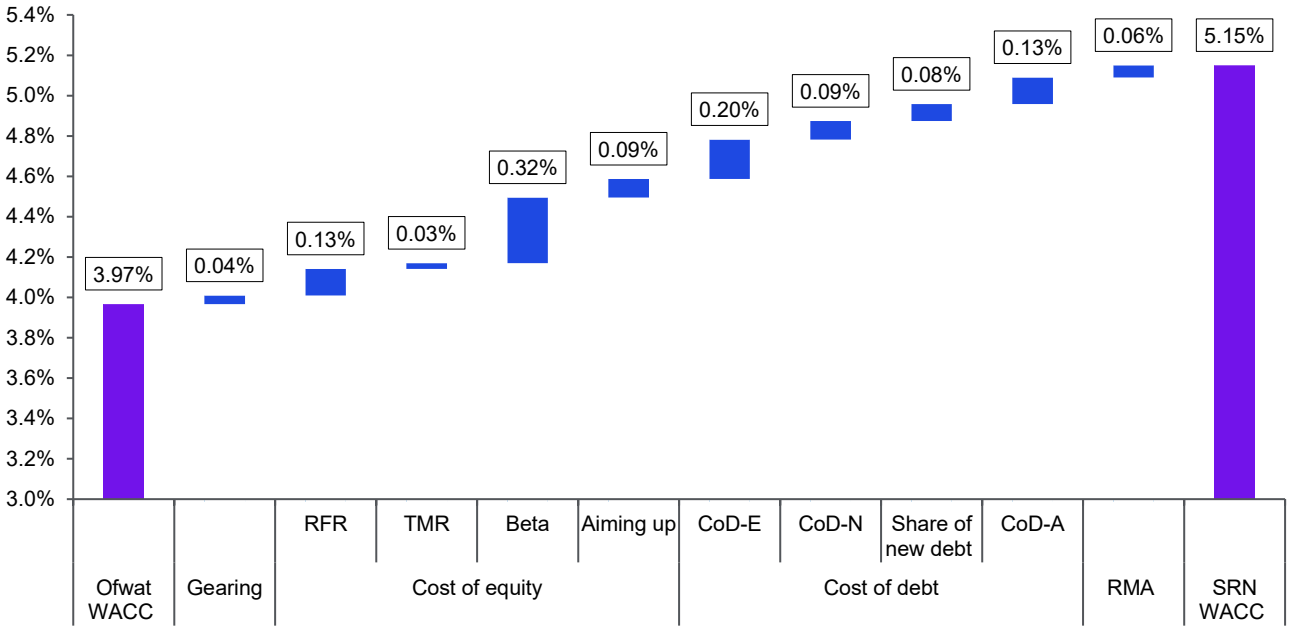
- Is not in the UK national interest or in the interest of our environment. It impedes implementation of the government's policies for improving the environment and its agenda to promote economic growth. In respect of the latter, the government recently placed a growth duty on Ofwat. An unfinanceable allowed return creates a regulatory barrier to investment and therefore Ofwat has also not met its growth duty.

7.3 Remedies

67. We request the CMA to replace Ofwat's unfinanceable allowed return with our estimate of the WACC. Our estimate of the WACC protects our customers against these harmful outcomes.

68. Ofwat's allowed return is 3.97% and our estimate of the WACC is 5.15%. Our estimate does not include aiming up for asymmetry. Ofwat's allowed return and our estimate of the WACC is bridged in the chart below.

Figure 2: Ofwat's allowed return vs SRN's estimate of the WACC (CPIH-real)



Notes: CoD-A refers to the sum of basis risk, cost of carry, liquidity cost and issuance cost.
Source: Southern Water analysis.

69. The gap between Ofwat's allowed return and our estimate of the WACC is c.£596m (nominal) in total over AMP8.

70. In addition, our risk analysis shows that a notional company with our specific characteristics is subject to downside asymmetric risk of 0.52%. This should be compensated through an asymmetric risk premium of 0.52% on top of our estimate of the cost of equity (or 0.21% on top of our estimate of the WACC). This amounts to an additional c.£100m (nominal) in total over AMP8.

8. Conclusion

71. The PR24 period is the most complex, busiest and arguably most important AMP in the recent history of Southern Water. We need to complete our Turnaround, which has seen continued shareholder support and management focus on improving the outcomes for our customers. We also need to reverse the recent history of regulatory underfunding and invest significantly in our environment to meet new statutory targets and our customers' expectations.

72. We have not taken the decision to seek a redetermination of Ofwat's PR24 final determination lightly. We see a large number of errors in this FD and this SoC reflects a high degree of concern that we have with the overall settlement – not least the significant imbalance of risk reflected in the FD.

73. In this conclusion, we discuss:

- **Positive impact from our SoC remedies and remaining risk:** We conclude with a reassessment of the likely risk outcome, if the CMA adopts each of the remedies suggested in this SoC; as well as the suggested treatment for the remaining risk; and

- **Limiting the impact on customer bills:** We want the final word in the SoC to focus on bills. The unprecedented increase in environmental regulatory requirements and the resulting generational increase in the level of investment in AMP8 will place an additional burden on customers' bills. We therefore ask the CMA to limit the impact of this SoC on our customers.

74. In Annex 8 (Post-remedy PR24 Calculations: Financeability and Retail Allowances), we outline a series of calculations which we would ask the CMA to take into account, when forming its final PR19 settlement. These include Ofwat errors, which the regulator has already agreed to change, the retail price, which changes to reflect wholesale bills and finally, cash flow levers, such as PAYG rates and the RCV-run off to ensure that the settlement is financeable.

8.1 Positive impact from our SoC remedies and remaining risk

75. As detailed the preceding sections, Ofwat has made a number of errors in its FD that require remedies from the CMA. These remedies impact the FD's allowances (botex and enhancements), operational targets (PCs and ODIs) and clawback and uncertainty mechanisms. Most of all, we have provided remedies that have sought to balance the risk and return of the final settlement.

76. We have updated our RoRE risk analysis, after the application of the remedies from this SoC are applied to the FD. The resulting risk ranges are materially more balanced with return.

Table 6: Risk ranges presented before and after applying requested remedies

	FD: Our risk analysis for a notional company like SWS				Post-remedies: Our risk analysis for a notional company like SWS			
	Mean	**P10**	**P50**	**P90**	**Mean**	**P10**	**P50**	**P90**
Totex	-2.62%	-3.74%	-2.60%	-1.50%	-0.27%	-1.37%	-0.37%	1.19%
Retail	-0.20%	-1.21%	-0.20%	0.78%	-0.20%	-1.21%	-0.20%	0.78%
ODIs + MeXes	-0.49%	-1.56%	-0.50%	0.57%	-0.14%	-0.83%	-0.16%	0.56%
Financing	-0.39%	-2.33%	-0.38%	1.53%	0.01%	-2.39%	-0.01%	2.41%
Revenue & Other	-0.04%	-0.08%	-0.03%	0.00%	-0.04%	-0.08%	-0.03%	0.00%
RoRE (simulated)	**-3.74%**	**-6.41%**	**-3.75%**	**-1.12%**	**-0.50%**	**-3.51%**	**-0.52%**	**2.57%**

Source: Our risk analysis.

77. While the remedies that we suggest have a positive effect on both the downside skew at the P50 position and also the P10/P90 positions, some residual asymmetric risk in the P50 remains negative. We have sought to work within the confines of Ofwat's regulatory framework. However, residual skew in the outcomes incentive package and non-deliver PCD risks at the P50 level are likely to still deliver a negative result for the notional company like Southern. This means that investors would still be unable to expect to earn the required return, in spite of the actions of management and significant improvements in performance.

78. In our WACC assessment, we outline our remedies for matching the WACC to the market expectations for returns in light of the inherent level of risk in the water sector following Ofwat's FD. While we identified the imbalance between risk and return, and the majority of the SoC has a positive effect on rebalancing most of the asymmetric risk, a residual amount of risk remains. Therefore for this remainder, we ask the CMA to add an aiming up adjustment to the industry WACC calculation.

8.2 Limiting the impact on customer bills

79. The unprecedented increase in environmental regulatory requirements and the resulting generational increase in the level of investment in AMP8, will have a significantly positive effect on our customers and our environment in which they live. However, we recognise that this will place an extra burden on our customers' bills, particularly in the first year of the AMP. Further, we recognise that certain of the remedies sought in this SoC will add to the increase in bills.

80. We want to ask the CMA to help to limit the impact on customer bills. In this SoC, we outline the following two actions through which the CMA could take regulatory action to mitigate the impact of bill increases:

- **Delaying more of the increase in bills:** We would like to see more of the increase in bills delayed into future periods, where the financeability of the company allows. We ask the CMA to consider the use of cash flow levers (PAYG rates and RCV run-off), to reduce the burden of bill increases on our customers; and

- **Focusing ODI penalties on those who need the most help:** We outline our current Social Tariff, which is designed to help those customers least likely to be able to afford an increase in bills. We asked Ofwat to re-allocate ODI penalties to our Social Tariff, but Ofwat did not change its regulation to accommodate this.

We recognise that there are barriers in the current system that would make an increase in support to our most vulnerable customers difficult to implement. However, we ask the CMA to work through the complications to allow a common-sense approach, and set a policy that permits additional support for our most vulnerable customers through re-distributing future ODI penalties.

9. Scope of the Statement of Case

81. In this Statement of Case, we have focused on the errors in the FD that are most material in that they have the greatest impact on us, our customers and our environment. That does not mean that we consider there to be no other errors in the FD; moreover, we recognise that this is a redetermination and the CMA has a wide remit, and that other errors may be put in issue by the other Disputing Companies. We reserve the right to make further submissions to the CMA in the event that the CMA identifies, of its own volition or in light of the cases advanced by other Disputing Companies, errors in the FD not expressly identified in this Statement of Case, including the right to seek further increases to our allowances to reflect those errors.

10. Explanatory materials

82. To aid the CMA in its review of our Statement of Case, we attach:

- A statement of those areas in the FD which are not being challenged in this Statement of Case (Annex 3)
- A table summarising where new material is included in this Statement of Case, which was not available at the time of the FD (Annex 4)
- A glossary of the key terms used in the Statement of Case (Annex 1)
- An index of the supporting materials referred to in this Statement of Case (Annex 9)

Chapter 1
Risk and Financeability

Risk & financeability

1 Executive Summary

1. Striking the correct balance of risk and return is critical for us to deliver value for customers in AMP8, in particular because we need to attract a significant amount of capital to deliver unprecedented levels of investments, meet ever increasing performance targets and protect our environment. For this reason, the **prime responsibility for any regulator setting the PR24 price control is to ensure there is a balance of risk and return, to ensure the financeability of the operation**.

2. AMP8 represents a step change in the level of risk that we face. New regulatory requirements, the unique ecological characteristics of our region, climate change, population growth and the significant degree of stretch in our performance commitments all contribute to a material increase in risk. A thorough assessment of risk and return and the impact on financeability, and intervention to mitigate any such impact, is a critical step in concluding whether companies are likely to succeed in delivering within the confines of Ofwat's regulatory determination.

3. Our AMP8 programme has many more requirements than those of other companies in the sector due to the unique characteristics of our region and it imposes materially more risk on us than compared to AMP7.

1.1 Errors

4. We have conducted our own risk analysis, inter alia, to quantify the likely range of Return on Regulated Equity (**RoRE**) performance under the FD for a notional efficient company operating in our region. We conclude that risk is not balanced with return and therefore interventions are required.

5. An efficient company's performance reflected in the analysis is based on the median observed performance in the sector over AMP7. In AMP7, only three companies performed at the median for the sector or better across all performance metrics including wholesale totex, ODIs and retail on a four year cumulative basis. A company performing at the median on all performance metrics is therefore in the top three companies in the sector (or upper quartile) based on AMP7 data. We have also made limited and targeted adjustments where our analysis indicates that the characteristics of our region (e.g. as a coastal one) would be reasonably expected to impact performance of a notional, efficient company.

6. In this SoC, we demonstrate the following errors:

   - **Prime Error**: Significant imbalance of risk and return, with an expected downside skew: Our analysis is comprehensive and robust. It shows that the FD subjects us to a level of risk that results in a materially negative outcome on an expected basis: the base-case median expected scenario results in -375bps of RoRE (£680m net penalties, 8.0% of AMP8 totex) and a plausible downside scenario results in -641bps RoRE (£1,164m of net penalties, 13.6% of AMP8 totex), as shown in the table below.

Table 1: Our risk analysis: Significant risk exposure for a notional Southern Water

	Our risk analysis for a notional company like Southern Water		
	P10	**P50**	**P90**
Totex	-3.74%	-2.60%	-1.50%
Retail	-1.21%	-0.20%	0.78%
ODIs + MeXes	-1.56%	-0.50%	0.57%
Financing	-2.33%	-0.38%	1.53%
Revenue & Other	-0.08%	-0.03%	0.00%
RoRE (additive)	**-8.92%**	**-3.70%**	**1.38%**
RoRE (simulated)	**-6.41%**	**-3.75%**	**-1.12%**

Source: Southern Water risk analysis.

7. Our analysis indicates a materially negative base-case RoRE (simulated) P50 and thus an expected return less than the allowed return. This is a significant and material penalty and impedes an investor's ability to earn the allowed return – even in the best-case scenario the RoRE (simulated) P90 is negative. The degree of negative RoRE means that the FD is not a 'fair bet' as investors are not likely to earn the required return.

- **Contributing errors: Ofwat's FD included a series of errors, which are detailed throughout our Statement of Case**: These errors taken in aggregate allocate a disproportionate degree of risk to us through the regulatory incentive mechanisms as a result of a series of errors including: (i) insufficient allowances; (ii) punitive outcome delivery incentive (**ODI**) rates; (iii) an overall skewed package of ODI incentives; (iv) Performance Commitment (**PC**) targets that do not reflect company-specific characteristics; (v) insufficient risk mitigations and (iv) an excessively punitive PCD framework. We discuss each of these areas in turn in the sections below.

- **Error in calculating risk correctly**: Ofwat failed to adequately consider the relationship between risk and return throughout the PR24 process which resulted in it falsely concluding that the risk derived from the FD was balanced with return. The PR24 Final Methodology did not find it necessary to "*prescribe a link between RoRE risk analysis and base allowed returns*"[1] and the risk analysis performed in the DD materially misstated the determination risk. The FD risk analysis represented a better but still deeply flawed methodology with unreliable results. Most pertinently, the analysis made inaccurate assumptions about symmetry of performance to derive base-case risk, frequently used AMP6 data in place of more recent and more relevant data, omitted key factors like embedded debt and non-delivery PCDs, and was of limited sophistication with Monte Carlo analysis only used for Outcomes risk.

  Our risk analysis represents a significantly improved methodology which produces substantially more reliable results. Our analysis uses more up-to-date and representative data and adopts a more statistically robust approach and indicates Ofwat's analysis materially understated the FD risk.

[1] Ofwat, December 2022, PR24 Final Methodology – Appendix 10 Aligning risk and return, page 8, SOC-11-0009.

- **Errors in calibrating the risk mitigation mechanisms**: The FD included the Outcomes Adjustment Mechanism (**OAM**) and Aggregate Sharing Mechanism (**ASM**), both of which were designed to limit risk exposure, but only in totex over/underspend and ODI rewards/penalties. The calibration of these mechanisms fail to mitigate risk sufficiently; and

- **Financeability error**: Finally, there were several errors in Ofwat's debt financeability assessment and its equity financeability assessment was inadequate. Consequently it had no robust basis to conclude the FD was financeable.

1.2 Impacts

8. Our risk analysis forms the basis of our financeability testing to assess whether a notional company operating in our region could attract the capital it requires, both debt and substantial new equity, in order to deliver the AMP8 investment programme. Correcting for the errors made in the financeability assessment in the FD, including the lack of adequate testing of equity financeability, our analysis, informed by our risk analysis, highlights several critical issues that render the notional company unfinanceable under the FD for both debt and equity.

9. An appropriate debt financeability assessment, using market-based tests, reveals that the notional company is unable to achieve the target credit rating of Baa1/BBB+ and instead would be rated at or below the lowest investment-grade rating, with no financial resilience against downside risk (P10). An assessment of equity financeability, using appropriate tests informed by market considerations and rational investor behaviour, shows that the risk-adjusted returns implied for the notional company are not competitive against comparators, and furthermore, an excessive proportion of the allowed return is placed at significant risk.

10. Those results demonstrate the notional company is not financeable under the FD given the risk exposure and allowed returns set by the FD, and consequently would be unable to attract the new capital required to deliver the AMP8 investment programme and outcomes for customers.

11. Overall, we have identified a series of errors in the FD, which critically require remediation to balance risk and return and to support our ability to procure capital in AMP8. Our own, robust assessment demonstrates that the FD is not a fair bet and is unlikely to attract the necessary levels of investment.

1.3 Remedies

12. The prime error in Ofwat's FD is the overall imbalance of risk and return, which threatens the financeability of the operation. We ask the CMA to remedy the series of errors that we outline in the remaining grounds below, each of which will have a positive impact on mitigating the downward skew in risk that we have demonstrated. We demonstrate in our Conclusion chapter the extent to which the remedies in this SoC could remedy for this prime error.

13. We propose amendments to the design of the OAM and ASM to ensure they offer the risk and financeability protection as intended.

2 Introduction

14. In this chapter, we consider the risk exposure faced by Southern Water in AMP8 and provide an analysis of the likely outcomes of the many regulatory decisions comprised in the FD.

15. We conclude that Southern Water's exposure to risk under the FD is excessive and is likely to lead to financeability constraints on the business. This means that the **FD's prime error is that there is an imbalance of risk and return in the final settlement**.

16. This chapter is structured as follows:

- Appropriate risk and return – a benchmark for regulation;
- Prime error: Imbalance of risk and return;
- Errors in the FD that drive the risk assessment result;
- Assessment of the financeability of the FD; and
- Our request of the CMA.

3 Appropriate risk and return – a benchmark for regulation

17. This section considers whether the regulatory framework established by the FD has the overall effect of balancing risk and return and therefore whether Ofwat has met its statutory financing duty. We consider:

- The need for balanced risk and return;
- Implications for financeability of imbalance in risk and return; and
- The role of balanced risk as a key regulatory benchmark.

3.1 The need for balanced risk and return

18. Water companies in the UK operate as private enterprises. Private commercial operations can incentivise efficiency and innovation to maximise profit and facilitate flexibility in financing. These opportunities come with risk, of which some should be borne by the private company. As monopolies, water companies may be able to pass an inappropriately large proportion of this risk to customers and other stakeholders in the absence of appropriate regulation. Water companies are regulated by Ofwat and a suite of environmental and quality regulators. The goal of this regulation is to set an appropriate challenge to management teams and shareholders to achieve operational targets which are of importance to customers or for protecting the environment.

19. Where risk is set by regulators, economic regulation needs to balance the shareholder return to remunerate for that risk. It follows that in designing a price control, economic regulators need to balance both the forms of regulatory control and the WACC return.

20. Given the alternative investment opportunities available to investors, excessive risk would lead investors to allocate capital elsewhere, to companies with higher risk adjusted returns. This also applies to debt investors where a higher perceived – or realised – risk will increase offered debt interest rates and limit access to some lenders.

21. A balanced allocation of risk is needed in the regulatory framework. If the regulatory framework has allocated more risk than the cost of equity is compensating for, investors will not commit capital as the market would provide alternatives with more attractive risk adjusted returns.

3.2 Implications for financeability of an imbalance in risk and return

22. Appropriate risk allocation within a regulatory framework is crucial to ensuring that a regulated company is able to attract the capital it needs to carry out its functions – that is, crucial to ensuring that the company is financeable. To achieve this appropriate risk allocation, two tests must be met.

23. First, there needs to be a direct and demonstrable link between the assessment of risk and the assessment of financeability. Financeability requires that the risks faced by a notional company are reflected in allowed returns and this return is achievable on mean expected basis. This ensures that the notional company used in regulatory modelling can realistically attract capital throughout the relevant regulatory period, such as AMP8 in the UK water sector.

24. Second, assessments of debt financeability should closely mirror the methodologies used by credit rating agencies. This is particularly important given that water companies are subject to licence conditions requiring them to maintain minimum credit ratings and also that the majority of debt investors have restrictions on lending linked to credit ratings. Ofwat's statutory financing duty,[2] therefore, must be interpreted to align with the real-world practices of rating agencies.

25. AMP8 requires significant equity investments from water companies. However, Ofwat's assessment of whether this equity would be forthcoming was limited and it therefore failed to consider that companies may have challenges raising the necessary capital in light of the allocation of risk and allowed return, jeopardizing investments in an essential service.

26. To avoid such situations, more appropriate and multi-faceted tests of both debt financeability and equity investability are needed. Importantly, these tests should incorporate market benchmarking of the sector's risk and return profile. This provides market context and ensures that the required returns are commensurate with the level of risk. Tests should also include an assessment of the absolute level of risk relative to investor risk appetite. This would ensure that the overall risk profile of the regulated entity, under both normal and stressed scenarios, is palatable to investors.

27. By adopting this comprehensive approach to risk allocation and financeability, Ofwat can create a more sustainable and resilient regulatory environment. This, in turn, helps ensure that regulated entities can continue to deliver essential services while also providing investors with fair and predictable returns.

3.3 Balanced risk: a key regulatory benchmark

28. Given the importance of financeability, a balance of risk and return is a key benchmark for assessing whether the overall PR24 settlement is in the interests of our customers and environment and the sources of finance which would fund necessary investment. These interests can only be met by ensuring we can raise the debt and equity finance we need to fund necessary investment. This reflects the financing duty to which Ofwat is subject and which applies equally to the CMA for the purposes of this redetermination.

29. In previous price controls, regulators have used the RoRE framework to assess the risk implied by the price control determination. We have found the usual emphasis on RoRE assessment to be lacking in PR24, compared with the assessment of the WACC risk return. Given the importance of both risk and return, we urge the CMA to place as much analytical effort on the assessment of RoRE, as we ask for its assessment of the WACC.

30. The PR24 regulatory framework is largely a roll-forward of the PR19 framework. For the first 4 years of AMP7, only 1 out of 17 companies has outperformed on totex and ODIs, with a median operational RoRE of -2.79%. Given that Ofwat at PR19 expected that "*efficient companies should be able to earn their allowed return on regulatory equity*"[3] clearly the package was mis-calibrated.

[2] Under section 2(2A) of the Water Industry Act 1991, SOC-1-0002, Ofwat must exercise and perform its relevant powers and duties in the manner which it thinks best calculated (among other things) to secure that statutory water companies are able (in particular, by securing reasonable returns on their capital) to finance the proper carrying out of their functions. The CMA is subject to this same financing duty in relation to its redetermination of the FD.
[3] Ofwat, December 2019, PR19 final determinations: Aligning risk and return technical appendix, page 5, SOC-1-0020.

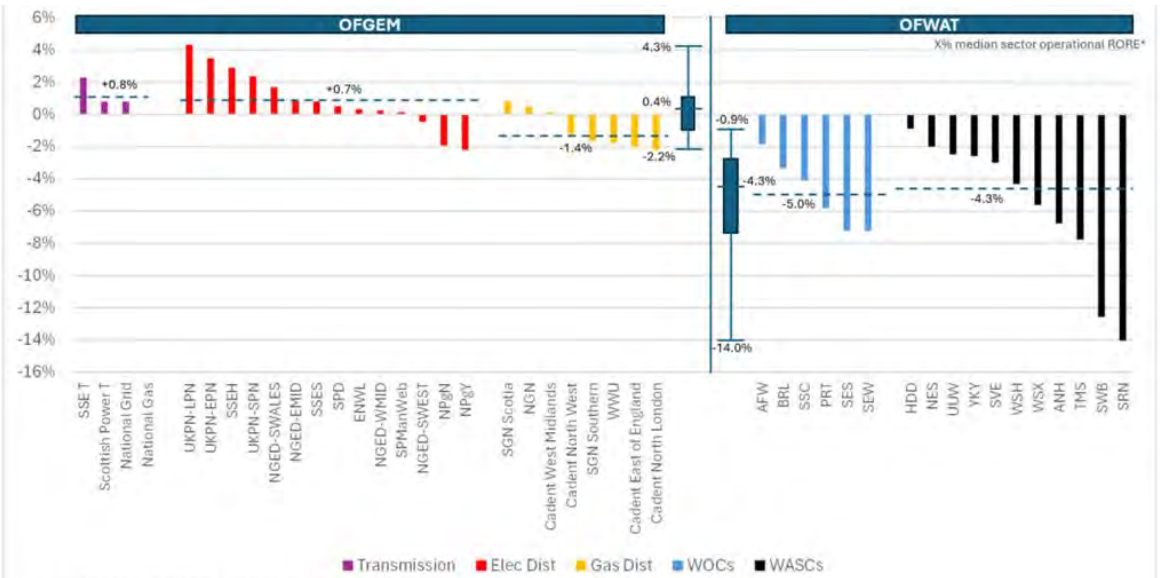
Table 2: RoRE performance vs base returns for first 4 years of AMP7

	Lowest*	P25	Median	P75	Highest*	Companies >0%	Companies <0%
Totex	-6.85%	-2.42%	-1.64%	-0.96%	0.62%	1	16
Retail costs	-2.64%	-0.92%	-0.47%	-0.29%	1.50%	1	16
ODI & Mexes	-1.93%	-1.16%	-0.66%	-0.46%	1.12%	2	15
Operational	**-10.97%**	**-3.88%**	**-2.79%**	**-2.09%**	**0.05%**	**1**	**16**

Note: *In each category.
Source: Company APR tables 1F.

31. This view is supported by a comparison of the water sector with gas and energy networks. For the latest set of data available in 23/24 all companies in the water sector are underperforming on operational RoRE. By contrast, there is a broadly even split of energy companies with a much narrower spread of RoRE around the base return. The water median operational RoRE is -4.3% vs energy's +0.4% This points to an issue with sector level calibration rather than any UK macro effects.

Figure 1: Operational RoRE vs base returns for 23/24 across water, gas and electricity regulated companies



Source: APR24 table 1F; Gas D, elec D and transmission from RFPR24
*Operational RORE includes totex, ODIs and incentives. All based on actual returns with notional capital structure for each sector.
Boxplot shows range, high and low quartiles and median

32. In the sections that follow, we outline the drivers of regulatory risk in the FD, followed by our RoRE assessment.

4 Prime error: Imbalance of risk and return

33. In this section we demonstrate that our risk exposure under the FD is excessive and unsustainable.

34. We do so by reference to our own risk analysis methodology, due to the inadequacies in Ofwat's assessment of risk and return in the FD.

35. This section is structured as follows:

- Drivers of regulatory risk in the FD;
- Ofwat's assessment of risk and return
- Our methodology for risk analysis;
- Results of our risk analysis; and
- Implications of the FD risk.
-

36. The results of the risk analysis are later used in the financeability analysis, and the financeability issue identified is explored further in Section 6 below

5 Financeability assessment

37. Our risk analysis quantifies the risk exposure from the FD for a notional company with Southern Water's characteristics. The results clearly and robustly indicate the level of risk that a notional company operating in our area would be exposed to is excessive and skewed to the downside. This means that the **FD's prime error is that there is an imbalance of risk and return in the final settlement**.

38. The below table set outs the conclusions of our risk analysis.

Table 3: Our risk analysis: Significant risk exposure for a notional Southern Water

	Our risk analysis for a notional company like Southern Water		
	P10	**P50**	**P90**
Totex	-3.74%	-2.60%	-1.50%
Retail	-1.21%	-0.20%	0.78%
ODIs + MeXes	-1.56%	-0.50%	0.57%
Financing	-2.33%	-0.38%	1.53%
Revenue & Other	-0.08%	-0.03%	0.00%
RoRE (additive)	**-8.92%**	**-3.70%**	**1.38%**
RoRE (simulated)	**-6.41%**	**-3.75%**	**-1.12%**

Source: Our risk analysis.

39. Our analysis indicates a materially negative base-case RoRE (simulated) P50 and thus an expected return less than the allowed return.

40. The P50 median expected RoRE (simulated) is -375bps RoRE or £680m[4] in real 2022/23 prices across the entire AMP. This is a significant and material penalty and impedes an investor's ability to earn the allowed return – even in the best-case scenario the RoRE (simulated) P90 is negative. The degree of negative RoRE means that the FD is not a 'fair bet' as investors are not likely to earn the required return.

5.1. Drivers of regulatory risk in the FD

41. In our Introduction to Southern Water Chapter, we set out the operational and environmental regulatory drivers behind the significant growth in investment and complexity inherent in our AMP8 programme. In summary, these are:

- **Environmental factors**. Our region has significant exposure to designated protected environments, for example Areas of Outstanding Natural Beauty, chalk streams, bathing waters, and shellfish waters. The protection of these zones is paramount and thus we have additional operational challenges such as stricter discharge permits and reduced abstraction allowances from affected waterways. In this context, our AMP8 capital programme requires innovative and novel solutions to meet the demands of our customers;

[4] All figures are quoted in £m 2022/23 real prices as impact across the entire AMP. Annual impact may vary, and figures are quoted as AMP total for simplicity.

- **Regulatory change**. Changes to statutory obligations have a particular impact in our region due to our ecological and demographic characteristics. We endeavour to meet these in full to best serve our customers and the environment and to meet our legal requirements. However, these require the delivery of complex and costly projects with unprecedented challenges. Key examples are our Water Industry National Environment Programme (**WINEP**) programme, Water Resources Management Plan (**WRMP**), and Phosphorus and Nitrogen removal schemes; and

- **Labour demand and supply**. Performance improvements from enhancement projects cannot be realised without sufficient and cost-efficient supply of labour to deliver those projects. Macroeconomic data indicates increasing shortages of UK construction labour which is compounded by a surge in demand in AMP8 by the infrastructure sector.

42. When we take our environmental requirements as a given, we note that Ofwat has added regulatory risk to its set of controls in the FD. Annex 6 to this SoC (Risk and Financeability Appendix 1: Economic regulatory risk in the Final Determination) contains a description of Ofwat's regulatory controls. In summary:

- **Totex**: The FD's allowances for base and enhancements are significantly below allowances levels that we have demonstrated are needed. This is against a backdrop of the most challenging and complex set of regulatory requirements in our recent history resulting in the highest capital intensity (measured as enhancement totex divided by opening RCV) in the sector to meet these new environmental standards;

- **PCDs**: The FD creates new clawback controls in AMP8 for where enhancement and some botex projects are not delivered on time or do not deliver benefits. These feature punitive and inflexible constraints on the more complex and significantly larger investment programme and fail to recognise the project reality that delays can occur outside of company control and under PCDs result in clawbacks where allowances are already spent;

- **Performance Commitments (PCs) and Outcomes Delivery Incentives (ODIs)**: The performance measures and incentives set by Ofwat some of which have potentially significant downside penalty exposure linked to weather and other exogenous factors;

- **Financing**: Given the significant increase in annual investment spending, the inflexibility and exposure placed on the company to manage its debt and equity costs are more constraining in AMP8; and
- **Risk mitigation mechanisms**: The FD establishes two core risk mitigation mechanisms. These include the Aggregate Sharing Mechanisms (**ASM**) to address tail risk on totex and ODIs and the Outturn Adjustment Mechanism (**OAM**) to address sector median ODI performance risk. The ASM features thresholds that are too high, and the OAM includes a deadband that limits the benefits it can confer. The calibration of these risk mitigations may not produce the results that the FD intended.

43. While this chapter assesses the risk exposure from these regulatory risks set in the FD, the remainder of the SoC outlines the errors inherent in the FD's decisions in each area. These errors are also driving our risk allocation and the key errors are detailed in Section 5 Errors in the FD that drive the risk assessment result.

5.2. Ofwat's assessment of risk and return

44. Ofwat set the real allowed return on equity at 5.10% (real CPIH deflated) for PR24 and determined that our base-case P50 RoRE risk arising from the framework is 0%. Ofwat therefore assumed that we will earn the allowed return in the base-case in AMP8. The assessment of risk in the PR24 FD was flawed and therefore materially overstated the return on equity we are likely to achieve.

45. A robust assessment of risk is critical for evaluating whether a regulatory determination provides a 'fair bet' to the companies it regulates. Ofwat ignored the importance of the relationship between risk and return in the PR24 Final Methodology: "*We disagree that it is necessary to prescribe a link between RoRE risk analysis and base allowed returns*".[5]

46. Ofwat acknowledged the risk analyses submitted by companies in the October 2023 business plans and August 2024 responses to the DD through risk analyses of its DD and FD respectively. However, the methodological limitations of these analyses made it insufficient for appropriately testing the determination's risk exposures and risk mitigations that the regulator has introduced and directly led to the incorrect conclusions that risk in the FD is balanced and manageable.

47. Table 4 presents a summary of key errors. Note this is not a complete list: see Annex 7 to this SoC (Risk and Financeability Appendix 2: Evidence of why Ofwat's approach to risk analysis is flawed) for a full description of errors.

Table 4: Summary of key errors in Ofwat's risk analysis in the PR24 FD

Risk area	Key error in Ofwat's PR24 FD risk analysis
General approach	• Inconsistent use of Monte Carlo simulation, which provides a closer approximation of returns available to investors. The FD only adopted Monte Carlo simulation for Outcomes risk and adopted a fixed approach across all other risk areas and an additive approach for aggregating total risk. • Estimation of base-case P50 risk as the mid-point between P10 and P90. The FD risks are negatively skewed and asymmetric, meaning the midpoint materially understates base-case risk. This is demonstrated by Ofwat's own datasets.
Wholesale totex	• Modelled base and enhancement totex risk together despite distinct risk characteristics and are different risk mitigations in the regulatory framework. • Assumed ±8.5% under- and out-performance at the P10 and P90 based on AMP6 sector performance. AMP6 data does not capture the risks associated with the scale and complexity of the AMP8 capital programme, being 4x AMP7 and even greater than AMP6. • Derived a base-case risk of 0% as the midpoint between the assumed P10 and P90. This did not incorporate the asymmetry in the historical data used by Ofwat, which indicates a P50 of 1.2% overspend.
PCDs	• Excluded risks associated with non-delivery PCDs. PCDs may clawback funding already spent where delivery is delayed due to factors outside of our control.

[5] Ofwat, December 2022, PR24 Final Methodology – Appendix 10 Aligning risk and return, page 8, SOC-11-0009.

	• Set a penalty:reward ratio for time-incentive PCDs payments using PR19 WINEP and WRMP performance data which may not be representative of AMP8 risks.
Retail	• Ignored the element of revenue risk whereby realised bad debt may exceed the bad debt allowance. An important risk for AMP8 given the bill increases. • Calculated risk using AMP6 data which ignores evidence from AMP7 demonstrating widespread underperformance on the retail profit margin. This approach ignored risk factors present in PR19 and likely present in PR24, e.g. general inflation and high interest rates.
Outcomes	• Assumed the FD target was achievable in the base case and thus calculated neutral performance for each ODI. Historical data suggests the ODI targets are very stretching vs current performance and thus underperformance is likely. • Derived distributions for Monte Carlo simulation from AMP6 data. This fails to incorporate more recent AMP7 performance and the change in ODI definitions from AMP6 to AMP8. • Calculated total outcomes P50 as the midpoint between simulated P10 and P90. This assumed symmetry of performance which is not supported by historical data. KPMG analysis calculated a P50 of -42bps[6] compared to Ofwat's midpoint of -22bps.
Financing	• Excluded embedded debt risk from the risk computation. Whilst companies may be able to align capital structures with the notional structure in future periods to achieve this embedded debt cost, they cannot influence existing debt raised before AMP8.
Market base delivery (DPC and SIPR)	• Ignored risks associated with market based delivery. The finalised commercial arrangement of individual schemes is required to fully assess the AMP8 risk, however the FD did not quantify the known risk associated with retendering costs in event of CAP default.

5.3. Our methodology for risk analysis

48. We have conducted our own assessment of risk as the CMA is unable to rely on the results of Ofwat's analysis or its conclusions due to the errors noted above, as well as Ofwat's past track record of miscalibration of risk at PR19 as outlined in Section 3 3.3 Balanced risk: a key regulatory benchmark.

49. We have conducted a comprehensive and detailed risk analysis considering the dynamics of the regulatory framework in AMP8 across a range of potential performance scenarios. Our methodology addresses the errors in Ofwat's analysis and produces a reliable assessment of potential performance.[7]

[6] KPMG, January 2025, PR24 Final Determinations – risk analysis for a notional company, page 20, SOC-1-0001.
[7] Our methodology is largely based on the methodology proposed by KPMG in its risk analysis detailed in the appendix of KPMG, January 2025, PR24 Final Determinations – risk analysis for a notional company, SOC-1-0001. We have made some changes to methodology to account for our region's unique characteristics and the specific regulatory parameters included in our PR24 FD.

50. Four steps are required to adopt a robust methodology:

- First, we estimate forward looking performance for all key performance indicators contributing to returns that must be considered and historical sector data must be analysed to form ranges of past performance;
- Second, we adjust the performance for company specific factors in a targeted way where strong evidence suggests a different future level of performance from the sector;
- Third, that performance can then be overlaid onto the PR24 framework as detailed in the FD; and
- Fourth, the aggregation of risks through Monte Carlo simulation brings together the individual components of the regulatory framework and captures the dynamics between risks.

51. We use the risk analysis methodology outlined in KPMG's sector-wide risk analysis to simulate plausible RoRE ranges for a notional company operating in our region.

52. Underlying performance is a critical input to the risk analysis and must balance between considering notional company risk reflected in sector performance and capturing company specific risk factors that a notional company would be exposed to in our region. Underlying performance can then be broken into two components:

- The baseline expected performance. Baseline performance is generally based on sector median and adjusted as needed for company specific risks to isolate notional company risk; and
- The distribution shape around the baseline performance. The distribution is applied around the baseline and is based solely on sector data to preserve notional company risk.

53. After specifying performance, we overlay the PR24 regulatory framework to translate performance into financial impact. This involved using our actual AMP8 RCV, allowances, ODI parameters including rates, PCLs, caps, collars and deadbands and a number of DPC and SIPR schemes. Capturing our actual FD parameters provides the best approximation of our risk allocation.

54. As part of the aggregation, we specify relationships between risk drivers. We maintained the correlations we identified in our Risk Appendix submitted as part of our DD Response.[8] These include a number of correlations between PCs and a correlation between cost performance and delay, which is relevant for understanding risk arising from PCDs. The correlations were identified using a rigorous methodology and only included where a sufficient operational explanation existed to support the quantitative analysis and that the explanation was reflective of notional company risk. We, along with several other companies, commissioned KPMG to conduct a sector-wide risk analysis of the FD[9] and cross checked our correlation analysis results against theirs. Our results were broadly in line with limited exceptions. We then applied adjustments to our analysis based on the correlations identified in a separate analysis we commissioned KPMG to undertake assessing exogenous risk factors on wastewater performance ODIs.[10] The resulting correlations on wastewater ODIs derive from time series analysis and can more robustly estimate correlations where seasonality (in particular worse performance in winter months) is present.

55. The results highlight that the incentive mechanisms in the regulatory framework create very large penalties in the base case for a notionally efficient company operating in our region.

[8]Southern Water, August 2024, SRN-DDR-012: Risk Appendix - Draft Determination Response, page 15-18, SOC-1-0003.
[9]KPMG, January 2025, PR24 Final Determinations – risk analysis for a notional company, page 55, SOC-1-0001.
[10]KPMG, March 2025, Impact of exogenous risk factors on wastewater ODI performance, page 25, SOC-1-0004.

5.3.1. Estimation of forward-looking physical performance

56. Base-case performance is set by estimating expected performance using empirical data as set out below. This methodology provides a robust approach to risk instead of simply assuming that the FD is achievable in the base-case.

- **Base totex**: Baseline expenditure is set based on the errors identified in Ofwat's cost assessments and the allowances we requested in the DD Response. This is the most robust baseline to use for a risk assessment as it represents Ofwat's own methodology of calculating efficient costs corrected for methodological and modelling errors. It captures the cost gap between our best estimate of costs and the FD allowance;

- **Enhancement totex**: The material increase in scale and complexity of the AMP8 capital programme requires a different approach for risk simulation, as historical sector data cannot properly capture the risks of such an unprecedented programme. The KPMG analysis[11] considered KPMG's infrastructure database,[12] wider market data, and sector data. It found that they all demonstrate that cost overruns on infrastructure projects are very common. Baseline performance against the FD enhancement allowance is therefore derived from KPMG's infrastructure database. The database indicates that projects with characteristics most similar to our AMP8 capital programme typically exceed budget by 6%; and

- **PCs**: We calibrated expected performance using average of AMP7 performance and business plan forecasts. This approach incorporates current performance levels whilst also including performance improvements expected from AMP8 expenditure. Baseline performance for total and serious pollutions is informed by the KPMG analysis[13] and adjusted to be appropriate for the notional-like SWS company.

57. Performance distributions, used to simulate around the expected performance, are established using a Metalog distribution specified using adjusted AMP7 performance statistics (10th, 50th, 90th percentile). The Metalog distribution type[14] is a flexible continuous distribution which facilitates asymmetry. The Metalog distribution has two primary advantages. Firstly, the distribution is flexible and can capture many different data sets well including asymmetric, bounded, and many different shapes.[15] Secondly, the distribution is also simple to use as it only requires a set of direct parameters without needing to rely on lookup tables or more complex statistical formulae,[16] similar to a normal distribution. The alternative to using the Metalog distribution is to assess each risk individually, conduct a fit test and select disparate distributions that may need to change as new information (for example 2024/25 performance data) is introduced into the sample. Given the flexibility and simplicity, the Metalog distribution type provides a significantly more robust representation of historical performance.

58. Outturn performance in AMP7 (Y1-4) has been used to inform PR24 risk distributions for most risks.

59. AMP7 data has been adjusted to reflect changes in AMP8 where practical because of the general weaknesses with data. Examples of adjustments that we have made include:

- The removal of totex performance stemming from energy in the historical performance because AMP8 includes an ex-post RPE true up for energy costs; and

[11] KPMG, January 2025, PR24 Final Determinations – risk analysis for a notional company, page 49, SOC-1-0001.
[12] KPMG's infrastructure database includes data on 56 infrastructure projects which are publicly available. Projects are global and cross-industry to account for the change in complexity and scale of UK water's AMP8 investment but also include UK water sector.
[13] KPMG, March 2025, Impact of exogenous risk factors on wastewater ODI performance, page 27, SOC-1-0004.
[14] T. Keelin, December 2016, The Metalog Distributions. Decision Analysis 13(4):243-277, SOC-1-0005.
[15] T. Keelin, December 2016, The Metalog Distributions. Decision Analysis 13(4):243-277, SOC-1-0005.
[16] T. Keelin, December 2016, The Metalog Distributions. Decision Analysis 13(4):243-277, SOC-1-0005.

- Adding back pollutions incidents excluded from AMP7 performance under the EA's exception for named storms because the EA has rescinded its exclusion for AMP8. The following paragraphs explain the details of how this adjustment was identified.

60. A freedom of information request (the table below) shows historical pollution incidents that were disallowed under a prior exemption from the EA for pollution incidents arising due to a named storm where companies took the necessary precautions. We have the highest number of exempted incidents.[17]

61. Historical sector performance was adjusted by adding back the incidents identified in the Table 5. The distribution parameters of the AMP7 performance were then calculated for total pollution incidents after adding back the previously excluded incidents to reflect this risk in our modelling.

Table 5: Number of pollution incidents due to named storm events exempted by the Environment Agency

Storm / Company	Arwen (2021)	Eunice (2022)	Franklin (2023)	Total
Anglian Water (ANH)	0	1	0	1
Welsh Water (WSH)	0	0	0	0
Northumbrian Water (NES)	40	0	0	40
Severn Trent (SVE)	22	0	0	22
South West Water (SWB)	0	0	0	0
Southern Water (SRN)	0	85	0	85
Thames Water (TMS)	0	7	0	7
United Utilities (UUW)	12	3	1	16
Wessex Water (WSX)	0	7	0	7
Yorkshire Water (YKY)	0	1	0	1

Source: Freedom of Information request to the EA.

62. Financing risk is simulated as inflationary and non-inflationary risk. Inflationary risk on CPIH is simulated using historical variation in CPIH since 2015. Basis risk is simulated using RPI, CPI, and CPIH data from Apr-2000 to Sep-2024.

63. New debt risk is quantified by comparing sector issuances in AMP7 (up to Sep-24) to iBoxx A/BBB 10+ years index average. Embedded debt risk is simulated using empirical data on sector debt costs compared with the FD allowance.[18]

5.4. Adjustments for company specific factors

64. Embedded in this methodology, we have captured the characteristics of our region that drive risk and would impact a notionally efficient company operating in our region.

65. It is critical that a robust assessment of risk includes these characteristics to reliably estimate forward looking risk. Performance on PCs is set based on median sector performance in AMP7 unless adjusted for company specific factors. We have highlighted the key characteristics identified in Annex 7 to this SoC (Risk and Financeability Appendix 2: Evidence of why Ofwat's approach to risk analysis is flawed) and how the methodology incorporates these into our risk analysis:

[17] Southern Water, August 2024, SRN-DDR-012: Risk Appendix - Draft Determination Response, page 11, SOC-1-0003.
[18] KPMG, January 2025, PR24 Final Determinations – risk analysis for a notional company, page 57, SOC-1-0001.

- **Scale and complexity of the capital programme**: We have the highest AMP8 capital intensity of the sector as a percentage of RCV. The AMP8 WINEP programme is our largest WINEP programme ever (which is four times larger than in AMP7), with material elements driven by the need to protect the sensitive environments in our region including shellfish waters and other protected habitats. Another driver is our reliance on protected environments as a significant source of water for treatment. Our regulators have increased investment needed to protect these environments and also decreased abstraction license from these environments. This requires us to invest in innovative and expansive programmes to meet the new statutory requirements and growing demand for water in our region;

- **Baseline performance on certain ODIs**:
  - **PCC**: we have achieved some of the highest levels of meter and smart meter penetration across our region and have positively impacted our PCC performance. A notionally efficient company operating in our region would also benefit from the high meter penetration and we therefore incorporate this expected benefit into baseline performance; and
  - **Leakage**: The baseline performance reflects that of the £166m we requested in DD representations only £61m (37%) was provided in the FD. Performance improvements are therefore assumed to be 37% of the DD Response forecasts.

- **Total pollution incidents and serious pollution incidents**: our region is exposed to climate change, extreme weather, and protected ecological characteristics which make meeting performance targets more challenging.[19] We commissioned KPMG to perform an analysis on the impact of climate change and the unique characteristics of our region to support a more reliable simulation of baseline performance across AMP8.

66. According to the KPMG analysis, our exposure to sensitive areas is significantly higher than sector average,[20] as shown in Table 6: Our exposure to sensitive areas compared to sector average below. Compared to the sector average, the coverage of our region of AONB, chalk streams and bathing waters is roughly double, while Shellfish water is four times larger.

Table 6: Our exposure to sensitive areas compared to sector average

	% AONB	% Chalk stream	% Shellfish water	% Bathing water	Population density
Southern Water	33.1%	2.2%	7.0%	0.2%	1.1
Sector average	15.5%	1.0%	1.6%	0.1%	1.0
Southern vs sector average	2.1x	1.2x	4.3x	2.2x	1.1x
p value	0.00027*	0.00321*	0.00000*	0.00178*	0.36770

Source: KPMG (2025), Impact of exogenous risk factors on wastewater ODI performance.

67. The KPMG analysis considers each of the 41 Local Authority Districts (**LAD**) in which we operate, our historical pollution performance data in each LAD and factors like our exposure to bathing water, shellfish water, chalk stream, and AONB. Population density was also included as a control factor.

[19] KPMG, March 2025, Impact of exogenous risk factors on wastewater ODI performance, page 17, SOC-1-0004.
[20] KPMG, March 2025, Impact of exogenous risk factors on wastewater ODI performance, page 14, SOC-1-0004.

68. The KPMG analysis suggests that if our region had sector-median ecological characteristics, the number of pollution incidents in AMP7 could have been up to 35% lower.[21] This difference highlights the significant influence of our region's ecological sensitivities on pollution incident likelihood. The EA assigns a higher pollution incident category where there was damage to protected sites, such as those assessed in the KPMG analysis, as more serious pollution incidents.

69. For example, an incident that would be assessed as a category 4[22] incident elsewhere may be assessed as a category 3 incident where the incident impacts a protected area. The total pollution incidents PC definition includes only incidents of categories 1 to 3. By including population density, the KPMG analysis also considers where these designated areas are located near highly populated areas increasing network asset concentration in and around protected environments. This proximity increases the risk of serious pollution incidents, making it challenging to meet performance targets.

70. The net result of incorporating this risk has increased our P50 risk by 18bps RoRE.

5.5. Overlay of the regulatory framework to calculate the company's allocated financial risk

71. Physical performance is translated into financial performance by applying the allowances, targets, rates and risk mitigations present in the FD. £m financial performance per risk area has been estimated and then converted into RoRE exposure.

72. The risk exposure is net of Ofwat's risk mitigants including the ASM, OAM, caps, collars, deadbands and RPEs. More specifically, the ASMs are applied in the risk modelling where totex and outcomes exceeds the RoRE thresholds.

73. The OAM is calculated based on the KPMG risk model's results for a notional Water and Sewerage Company (**WaSC**) as the best proxy for sector median results on outcomes.[23] This modelling indicates a modest adjustment of 23bps which is then applied to all scenarios. This assumes that a company in the sector will achieve the median performance simulated by KPMG on average over AMP8.

74. Caps, collars and deadbands are applied to the individual ODIs as specified in the FD. The risk model allows for the direct application of these risk mitigants onto the specific ODIs. This reflects our FD.

75. Finally, the RPE for energy is incorporated by adjusting historical power costs from AMP7 data used to model base totex risk for AMP8 to best approximate the impact of the ex post true up on an economic basis. Net of the ex post true up, energy price risk is not borne by the company and effectively removed from this analysis.

[21] KPMG, March 2025, Impact of exogenous risk factors on wastewater ODI performance, page 16, SOC-1-0004.
[22] Incidents are categorised into 4 categories based on level of impact, with 1 being the most impactful. Category 4 incidents are those assessed as having no impact and are excluded from ODI reporting.
[23] KPMG, January 2025, PR24 Final Determinations – risk analysis for a notional company, page 36, SOC-1-0001.

5.6. Aggregation of risk components through Monte Carlo simulation to derive overall RoRE exposure for a notional company

76. Aggregated risk profiles have been calculated, both by risk component (totex, retail, ODIs, MeXes, financing, other) and in total, using Monte Carlo simulation. In contrast to the additive aggregation adopted by Ofwat, Monte Carlo simulation more robustly incorporates the shape of the risk distributions and the constituent risks and the relationship between them. It therefore provides a better estimation of returns available to investors.

77. As described previously, the resulting correlations we use are from our own analysis and a report from KPMG on wastewater ODI performance,[24] cross checked by the KPMG sector risk analysis.[25] The risks captured are risks a notional company operating in our region would be exposed to and help to enhance the reliability of the risk analysis results. The presence of correlations is important to capture and specify in Monte Carlo simulation. If we omit any correlations, we will underestimate risk.

78. We also adopted correlations between cost and delay performance to inform the risk analysis on PCDs more specifically. As this is a new risk factor with limited data available this was based on the KPMG risk analysis, which estimated the correlation based on their infrastructure project database.[26]

79. For financing risk, we also adopted the correlations adopted by KPMG in their risk analysis between real interest rates and inflation as well as between different measures of inflation[27] for more reliably simulating basis risk.

80. Generally, we took a conservative view by adopting a correlation of zero where we did not have strong evidence of the presence of a correlation. We also applied a threshold of ±0.15 to any correlation and only included correlations where a strong operational rationale existed to support the quantitative results. These criteria help to eliminate spurious correlations, or correlations due to coincidence, as well as any inefficiency.

81. There are other risks which we expected would have correlations but were not included in our correlation analysis due to data limitations. Should any additional risks be positively correlated but were omitted from our analysis, our risk analysis would understate the true risk. Conversely, should any additional risks be negatively correlated but were omitted from our risk analysis, our risk analysis would overestimate the true risk.

82. In conclusion, the correlations identified were captured in the Monte Carlo analysis and were broadly positive, thereby increasing the risk identified in the analysis. All other risks were assumed to have a correlation of zero.

5.7. Results of our risk analysis

83. Our risk analysis quantifies the risk exposure from the FD for a notional company with Southern Water's characteristics. The results clearly and robustly indicate the level of risk that a notional company operating in our area would be exposed to.

[24] KPMG, March 2025, Impact of exogenous risk factors on wastewater ODI performance, page 25, SOC-1-0004.
[25] KPMG, January 2025, PR24 Final Determinations – risk analysis for a notional company, SOC-1-0001.
[26] KPMG, January 2025, PR24 Final Determinations – risk analysis for a notional company, page 49, SOC-1-0001.
[27] KPMG, January 2025, PR24 Final Determinations – risk analysis for a notional company, page 58, SOC-1-0001.

84. The below table compares our risk analysis results to those produced by Ofwat. For the reasons outlined in Annex 7 to this SoC (Risk and Financeability Appendix 2: Evidence of why Ofwat's approach to risk analysis is flawed), Ofwat's risk analysis results are not reliable or robust estimates of risk. The primary driver of the differences between these results is the improved methodology we employ to capture more reliably the risk allocated in the incentive mechanisms, the use of source data most reflective of AMP8 risk and the use of Monte Carlo simulation techniques. We have included additive RoRE risk to provide a more direct comparison to Ofwat's analysis, however additive RoRE is not a reliable estimate of returns available to investors and is included for comparison purposes only.

Table 7: Our risk analysis compared to Ofwat's risk analysis results

	Our risk analysis for a notional company like Southern Water			Ofwat's risk analysis for a notional company like Southern Water		
	P10	**P50**	**P90**	**P10**	**P50**	**P90**
Totex	-3.74%	-2.60%	-1.50%	-2.08%	0.00%	2.08%
Retail	-1.21%	-0.20%	0.78%	-0.30%	0.00%	0.30%
ODIs + MeXes	-1.56%	-0.50%	0.57%	-2.17%	-0.32%	1.54%
Financing	-2.33%	-0.38%	1.53%	-0.70%	0.30%	1.30%
Revenue & Other	-0.08%	-0.03%	0.00%	-0.05%	-0.03%	0.00%
RoRE (additive)	**-8.92%**	**-3.70%**	**1.38%**	**-6.94%**	**-0.04%**	**6.85%**
RoRE (simulated)	**-6.41%**	**-3.75%**	**-1.12%**	**N/a**	**N/a**	**N/a**

Source: Our risk analysis, Ofwat's PR24 Risk analysis "PR24-FD-RR04-PR24-RoRE.xlsx".

85. Our analysis indicates a materially negative base-case RoRE (simulated) P50 and thus an expected return less than the allowed return.

86. The P50 median expected RoRE (simulated) is -375bps RoRE or £680m[28] in real 2022/23 prices across the entire AMP. This is a significant and material penalty and impedes an investor's ability to earn the allowed return – even in the best-case scenario the RoRE (simulated) P90 is negative. The degree of negative RoRE means that the FD is not a 'fair bet' as investors are unlikely to earn the required equity return and the expected P50 return is lower than the cost of debt.

87. For the sole purpose of comparing analysis results, we consider our risk analysis results in RoRE (additive) P50 of -370bps RoRE or £670m, which contrasts with Ofwat's P50 RoRE additive calculation of -4bps or £7m – a difference of £663m. Ofwat's analysis of the P50 risk contains a series of errors and is not a reliable estimate of our risk.

88. Expected P50 underperformance receives little mitigation under the FD. The OAM provides some protection; however, it is insufficient to address the risk imbalance which is mostly driven by the risk on totex.

89. The worst-case RoRE (simulated) P10 risk is significantly negative at -641bps or £1,161m and would almost fully erode the allowed return under our analysis. The risk mitigations embedded in the FD are not sufficient at controlling excessive downside risk. For example, total pollutions collars and internal sewer flooding collars provide 174bps and 4bps protection respectively in terms of avoided penalties in the P10. However, the collars do not sufficiently mitigate the downside exposure when aggregated across ODIs and the Outcomes ASM is not triggered due to high

[28] All figures are quoted in £m 2022/23 real prices as impact across the entire AMP. Annual impact may vary, and figures are quoted as AMP total for simplicity.

thresholds. This puts the notional company like Southern Water at risk of a credit rating downgrade below investment-grade credit ratings. Ofwat requires that companies maintain a rating of Baa2/BBB negative outlook in the license conditions of each water company. The impact on financeability is considered in detail in Section 6 Financeability assessment .

90. The aggregate sharing mechanisms (ASM) provide risk mitigation of 50% sharing on wholesale totex and outcomes above ±2.00% and ±3.00% RoRE respectively. Our analysis shows that ASM does not adequately protect us in the downside scenario for totex as there is a material residual totex risk in P10. The suite of ODI collars, recalibration of the outcomes package, the OAM and increased allowances all introduced in the FD provide significantly more protection compared with the DD.

91. Notably, we conducted similar risk analysis at DD and can compare the results. The notional company risk simulated RoRE performance is shown in 8 below demonstrating that RoRE performance improved from DD to FD by roughly 15-20% in the P10 and P50, however that the P50 is still materially negative. The P90 also improved more materially by 40% but remains negative. While these improved risk protections materially improved the RoRE risk overall, it is still insufficient to fully address the P50 risk. For example, our expected performance against the FD will likely trigger the totex ASM in the P50 based on the scale and complexity of our capital programme and cost gaps on base totex. Whilst the totex ASM provides 60bps protection at P50, the totex risk remains high at -2.60% in the P50.

Table 8: Our risk analysis results at DD compared to FD

	Our risk analysis for a notional company like Southern Water		
	P10	**P50**	**P90**
DD RoRE (simulated)	-7.10%	-4.18%	-1.27%
FD RoRE (simulated)	-6.41%	-3.75%	-1.12%

Source: Our risk analysis of both the FD and the DD, which was included in our DD Response.

92. Overall, the degree of negative RoRE means that the FD is not a 'fair bet'.

93. The P90 performance is materially negative at -112bps or -£202m. It therefore provides no positive upside. Our analysis implies that Ofwat has significantly overestimated the upside, as seen in Table 7.

94. The range of potential outcomes from our analysis implies that the FD did not provide either adequate scope for outperformance in a best-case scenario nor sufficient protection in a worst-case scenario. These are driven by inter alia:

a) **Underfunded allowances and degree of stretch in PCLs:** These contribute to a negative P50 risk which in turn is the primary driver of limited upside and severe downside. Remediating the negative P50 would create a more reasonable ±260bps RoRE range. As Ofwat erroneously calculated neutral P50 risk (P50 in Table 7 for Ofwat's risk range was -4bps), they did not address this issue; and

b) **Asymmetric mechanisms stemming from errors in the regulatory design:** There is material skew in the design of the outcomes package where each individual ODI has limited upside and material downside – this is especially driven by penalty-only ODIs and ODIs that have natural restrictions on outperformance which creates asymmetry. Negative skew from the outcomes package contributes to the negative P50 and was only partially captured by

Ofwat's risk analysis. In addition, non-delivery PCDs have no ability to outperform. Asymmetry from non-delivery PCDs were not captured in the Ofwat range.

95. It is also helpful to consider the components of risk to further inform how the FD specifically drives risk. Some incentives like allowances and targets were set reflecting errors and are not expected to be achieved in our P50 scenario (calibration risk). Some incentive mechanisms are asymmetric and by design will allocate asymmetric risk to us (design risk). This distinction is important as even if all allowances and targets are individually corrected, residual design risk will still persist. The next section provides a decomposition of risk between design and calibration risk to quantify risk that could remain should all allowances and targets be achievable.

5.7.1. Risk decomposition

97. We set out decomposition of risk in Table 9 below to split the P50 risk between design risk and calibration risk. The difference between design and calibration risk is relevant in the context of a CMA determination as it indicates the type of remedy required as calibration risk can be more easily corrected with targeted adjustments to allowances and targets while design risk requires more involved changes to the regulatory framework.

98. Our total range reflects a reliable estimate of risk facing a notionally efficient company in AMP8 because we derived these results with a robust empirical and analytical approach. The separation is helpful as design risk is less influenced by assumptions and demonstrates failures in proper regulatory design which need to be addressed by the CMA. In addition, design risk is less contentious and does not rely on technical expertise to identify how it drives risk.

99. Calibration of risk relies on a number of assumptions such as efficient cost levels and achievable performance improvements and is more challenging to estimate. KPMG's sector-wide risk analysis performed a similar decomposition[29].

100. A notionally efficient company operating in our region's P50 risk decomposes into the following:

Table 9: P50 risk decomposition into design and calibration risk

	Our risk analysis for a notional company like Southern Water		
	P50	**Design risk**	**Calibration risk**
Totex	-2.60%	-0.49%	-2.11%
Retail	-0.20%	0.00%	-0.20%
ODIs + MeXes	-0.50%	-0.28%	-0.22%
Financing	-0.38%	0.00%	-0.38%
Revenue & Other	-0.03%	0.00%	-0.02%
RoRE (simulated)	**-3.75%**	**-0.72%**	**-3.03%**

Source: Southern Water.

101. Design risk can be thought of as the risk that would persist if all targets and allowances are achievable. A negative risk as seen in the RoRE (simulated) results above mean that some risk is

[29] KPMG, January 2025, PR24 Final Determinations – risk analysis for a notional company, page 8, SOC-1-0001.

driven by the asymmetric nature of some regulatory incentive mechanisms. The design risk implied reflects -72bps or £130m penalty of risk.

102. We present the decomposition of design risk at the P50 because: (1) negative expected base-case risk cannot be factored into the CAPM, (2) the negative P50 is the most significant driver of excessive P10 risk and insufficient P90 upside. The drivers of the negative P50 design risk in the PR24 FD are listed below.

- **Non-delivery PCDs and Time-incentive PCDs**. These mechanisms create asymmetry in the regulatory framework due to downside only outcomes. Where projects are in progress, it is not clear how Ofwat will disapply clawbacks due to material regulatory discretion. Time-incentive PCDs also feature an imbalanced reward:penalty ratio creating scope for P50 risk. PCDs cover 80% of our enhancement programme. Most of the programme relates to statutory requirements, and thus PCDs create a risk of clawing back allowance which is required to meet our obligations and which we would therefore be spend in any event. The impact of PCDs is material because of the size of our AMP8 programme. Larger and more complex capital programmes have a high risk of late delivery. For more information on these issues, please refer to Chapter 5: PCDs; and

- **ODIs & Measures of Experience skew**: The distributions of financial outcomes for many of the ODIs have more downside risk than upside potential individually. Where the ODIs are correctly calibrated, the simulated total risk across all outcomes includes negative base-case RoRE. This reflects that in a given year, where all ODIs are set such that the PCL is achievable in the P50, a notional company can expect to outperform mildly on some ODIs while underperformance materially on other ODIs resulting in a net penalty. Ofwat's own data indicated a negative P50 for our ODIs risk, and we agree that our analysis supports the conclusion that the skew in individual ODIs results in a negative P50 for outcomes overall.

103. Our analysis indicates that skew on individual ODIs is most prevalent in two groups of ODIs:

- **ODIs with limited scope for outperformance**: several ODIs have inherently asymmetric risk profiles that are not appropriately limited with caps and collars. For example, WSI has a PCL of 5mins. Best possible performance is 00:00 mins and historical best is 01:31 by Portsmouth Water. These equate to 11bps[30] and 7bps[31] outperformance after considering the enhanced performance threshold in our FD. The collar of 1.00% water regulated equity equates to 28bps RoRE. The downside potential is therefore 3-4 times greater than the upside potential.

  This phenomenon is also present in Total Pollutions Incidents where our company specific characteristics are not sufficiently taken into consideration in setting the PCL and in our demand based PCLs that do not sufficiently consider our historical performance.

- **Penalty-only ODIs**: all three penalty-only ODIs, i.e. CRI, discharge permit compliance, and serious pollution incidents, have deadbands included in the FD. However, the lack of upside still persists, and significant negative returns are expected in the base-case and worst-case scenarios contributing to the overall outcomes skew.

[30] The calculation is 05:00 target against 00:00 performance resulting in 02:21 at the normal ODI rate of £0.51m per minute or £1.2m and 02:39 at the enhanced ODI rate of £1.02m per minute or £2.7m. Over the five years of the AMP this equates to £19.5m or 11bps RoRE.
[31] The calculation is 05:00 target against 01:31 performance resulting in 02:21 at the normal ODI rate of £0.51m per minute or £1.2m and 01:08 at the enhanced ODI rate of £1.02m per minute or £1.2m. Over the five years of the AMP this equates to £11.8m or 7bps RoRE.

Should each individual incentive mechanism be corrected, there may remain residual risk that may need further remedies beyond the specific errors due to the design of the FD.

5.8. Additional risk factors

104. Our analysis does not capture the potentially duplicative nature of the DDCM as there was inadequate specification in the FD to conclude definitively how the DDCM would impact our risk allocation. Based on the FD, there is scope for duplication. This is explained in Chapter 5: PCDs.

105. The contingent funding potentially provided by the Delivery Mechanism[32] could amount to £553m allowance for us. This allowance is needed to deliver against statutory obligations relating to water quality monitoring, storm overflows, phosphorus removal and nitrogen removal. There is risk that if the funding is not granted, it could result in:

- Failure to meet the associated statutory obligations through lack of investment and thus the imposition of regulatory fines; or
- Overspending to make the investment without allowances.

106. The funding once granted would carry the same risks as the non-contingent enhancement funding, i.e. cost and delivery risk made more severe by the already significant magnitude of AMP8 programme. This risk is not captured in the risk ranges and therefore if added would result in would materially increased totex risk by increasing the scope of the capital programme. There may also be implications for financeability of this increased level of risk.

107. Should Ofwat clarify the function of the DDCM during the appeal we may need to reassess its impact on our risk allocation.

5.9. Implications of the FD risk

108. Our analysis demonstrates that the FD presented an incentive package with material downside asymmetry. Ofwat's assessment of risk fails to identify this. As a result, the regulator concluded in error that the FD is an appropriate framework for PR24 and therefore failed to consider the true implications of it.

109. The key errors that drive the most material elements of our risk allocation include Ofwat's failure on totex to capture the scale and complexity of the capital programme in setting allowances. Relatedly, Ofwat's failure to capture company specific risk factors in its calibration of PCs and ODIs disproportionately exposes us to outsized risk while simultaneously providing insufficient base totex allowances to improve performance. PCLs were also set too stretching introducing expected underperformance and skew in the outcomes package. Neither allowances nor PCLs reflect these points.

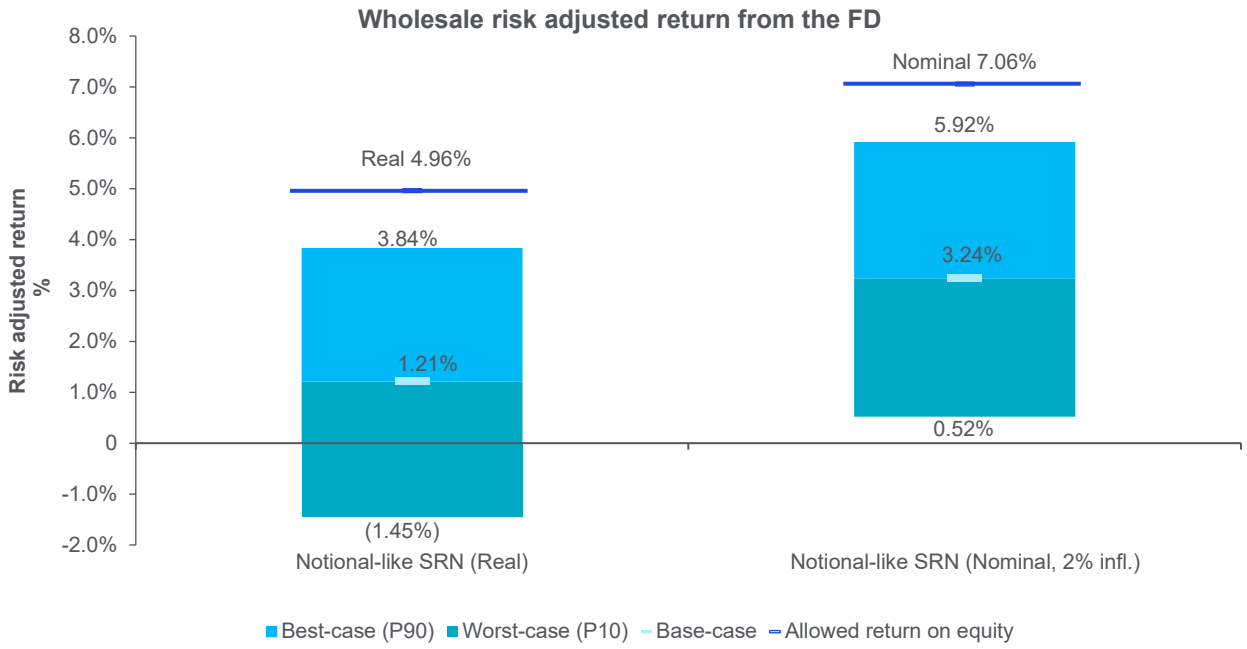
110. The risk resulting from the FD would not be assessed as appropriate per Ofwat's considerations in the FD when calculated with a robust analytical methodology.

111. We have graphed our risk-adjusted nominal returns considering the allowed return on equity net of our RoRE performance. The base-case expected outcome is not a 'fair bet' because investors cannot expect to earn the required return. Even in the P90 investors cannot earn the allowed return. The results of the risk analysis deviate materially from Ofwat's analysis and violate Ofwat's

[32] Ofwat, February 2025, PR24 final determinations: Expenditure allowances, page 334, SOC-1-0006.

assertion that the FD is balanced. The level of risk prevents an investor from earning the allowed return and jeopardises our ability to raise capital to deliver the capital programme.

Figure 2: FD risk adjusted return for notional-like SWS



Source: Southern Water calculation.

112. In the FD, there was a misallocation of risk towards companies, which was not balanced with the allowed return. This does not support financeability and will challenge our ability to raise capital to deliver the investment programme, this is explored further in Section 6 Financeability assessment. It is therefore in the best interests of customers and all stakeholders to balance risk and support our capital raising to enable us to deliver the investment programme.

113. Without remediation to the P50 underperformance, the FD risks severely damaging our AMP8 credit ratings headroom. Should the headroom deteriorate entirely below the levels required to maintain a strong credit rating, our interest costs may also increase. The combination of penalties and higher financing costs may divert funding away from needed investment, delaying improvements to service for customers. A fair and balanced FD is needed to prevent this negative feedback loop.

114. The inappropriate allocation of risk in the FD will impact our ability to raise investment and our financeability. The negative P50 cannot be captured purely in the cost of capital estimated under the CAPM and therefore this risk is not priced by the current allowed return. Therefore, mechanisms must be adjusted to reduce risk exposure firstly to address each of the errors identified in the FD and outlined in Section 5 Errors in the FD that drive the risk assessment result. And secondly, any remaining risk net of the requested remedies may require further adjustments to the risk allocation or can be priced into the cost of equity.

115. There is a direct link between risk and financeability as outlined in Section 3 Appropriate risk and return – a benchmark for regulation. Ratings headroom must be sufficient to maintain the rating

should base case and worst-case scenarios unfold. The financeability analysis provides a detailed analysis of this relationship and tests financeability using the output of this risk analysis.

6 Errors in the FD that drive the risk assessment result

116. We have identified a number of errors in Ofwat's FD which are described below. These errors have a knock-on impact on the balance of risk and return, and in aggregate negatively impact our ability to maintain Baa1/BBB+ credit ratings during AMP8 while delivering our capital programme and meeting our service targets.

6.1. Cost gaps

117. Cost gaps impact our risk by creating expected overspend on our totex programme.

118. The expected overspend is partially mitigated by the cost sharing and other mitigations in place in the FD, but ultimately results in negative RoRE impact. The cost gaps identified directly impact that totex line P50 scenario RoRE results.

119. There is a cost gap on enhancement totex totalling £304m which we are challenging in our AMP8 programme. This material underfunding is a result of a series of decisions that Ofwat made in the FD. This materially and negatively impacts our risk and challenges financeability:

- First, a cost gap of £107m that we are challenging arises from the assumed overlap between base cost and enhancement costs and leads to material underfunding of the requested enhancement costs. This is particularly notable in relation to water enhancement, mainly in relation to the mains replacement assumptions and split between base and enhancement funding;

- Second, Ofwat has also made a modelling error with respect to the resilience enhancement proposals covering five sites. This error results in an additional cost of £60m which we are challenging. For more detail, please refer to Chapter 3: Enhancement (Cost assessment);

- Base totex was also underfunded due to modelling errors and rejected Cost Adjustment Claims (CAC) and energy RPE error. A cost gap of £41mm arose from the wastewater base cost econometric modelling as a result of Ofwat in error including "Load treated in size bands 1 to 3 (%)" as an explanatory variable in its wastewater modelling suite despite it failing modelling robustness tests;

- A cost gap of £53m arose from the water base cost econometric modelling as a result of Ofwat in error including "Average pumping head (APH)" as an explanatory variable in its water models despite it not being of good data quality;

- A cost gap of £47m arose from Ofwat's use of a limited data set on power costs and an optimistic forecast for energy prices. Ofwat calculated the Energy RPE ex ante adjustment on power cost allowances based on the share of power costs relative to base over the last five years only. This methodology deviates from other cost allowance calculations that consider more historical data going back to 2011. A larger historical data set captures the cyclical nature of costs and more accurately approximates the right level of spending. Furthermore, Ofwat also sets an unrealistic glide path for future energy prices, beyond the reduction assumed by Government forecasts;

- Ofwat should have considered more data to capture the cyclical nature of costs. Due to proactive risk management, we delayed the full impact of the recent energy crisis through our energy hedging programme allowing us to realise materially lower energy costs over AMP7 than the wholesale market prices. Hedging programmes can only delay rather than avoid higher energy prices. Ofwat's analysis suggests that we will continue to pay less on power costs due to the limited data set considered; and

- Other cost gaps were identified on base totex and more details can be found in Chapter 2: Base costs and other areas of enhancement as shown in Chapter 3: Enhancement (cost assessment).

6.2. Asymmetric PCDs

120. Both non-delivery PCDs and time-incentive PCDs significantly negatively impact our risk exposure.

121. Non-delivery PCDs impact our risk allocation by introducing the potential for allowance clawbacks for undelivered schemes which are punitive, inflexible, subject to regulatory discretion and have no equivalent upside.

122. Time-incentive PCDs introduce risk through a calibration error where the penalty and reward rates applied would not be expected to net off in our expected performance. These risks are built into the totex line of the risk analysis and the below table breakdown their individual contribution to the total risk analysis.

Table 10: Enhancement totex risk breakdown including PCDs

	P10	P50	P90
Cost performance	-2.63%	-0.87%	0.25%
Non-delivery PCD	-0.92%	-0.28%	-0.04%
Time-incentive PCD	-0.20%	-0.07%	0.06%
Total enhancement totex risk	**-3.22%**	**-1.34%**	**0.09%**

Source: Risk analysis of the FD.

123. There was a widespread introduction of PCDs in the FD which, due to design errors, increase our risk allocation.

124. Non-delivery PCDs could result in clawbacks on partially delivered programmes where schemes are late but fully intended to be delivered. Infrastructure projects are often subject to delays and the design of the non-delivery PCDs do not take this into account. There is also no flexibility, for example, when delays occur outside of our control or when new delivery dates are agreed with EA or DWI. This introduces scope for in-flight projects to be subject to clawbacks in circumstances where we have already spent some of the allowances. Ofwat attempted to control for this risk by introducing a grace period for late delivery, however, the wording is vague and unclear and introduces regulatory discretion as to how and when Ofwat will disapply clawbacks. Finally, the lack of opportunity for early delivery upside, combined with the other factors above, contribute to our overall base-case risk and negative downside skew.

125. Some non-delivery PCDs apply to base totex, which is not appropriate based on how allowances are set in base totex. There are no explicit allowances for components of the base totex programme as the overall allowances are set by the econometric cost models. Therefore, the

amount of spend subject to a PCD in base is arbitrary and introduces scope for a mismatch between efficient costs to deliver work covered by a PCD in base totex and the amount of allowance subject to clawback in the PCD. This introduces further risk on our base totex programme where spend can occur and also be clawed back.

126. Time-incentive PCDs apply penalties to schemes delivered late and rewards to schemes delivered on time. The penalty:reward ratio was calibrated using expected timely delivery of 75% of projects driven by PR19 WINEP data. Ofwat extrapolated this proportion of timely delivery to form the basis of the penalty and reward rates creating a ratio of 75:25 or 3:1, meaning the penalty rate is three times the size of the reward rate. This also ignores the changing risk dynamics for AMP8 programmes.

127. Whilst there was limited application of PCDs in PR19, PCDs in PR24 covered c.80% of the enhancement programme.

128. The decision to extensively apply these PCDs, which are asymmetrically designed, failed to consider the compounding effect that this would have on the heightened delivery risk in AMP8. A larger and more complex capital programme is more likely to be delivered late. Additionally, there is potential for duplicative costs where (i) our regulators can levy fines for not delivering statutory requirements on time; and (ii) we may have to return allowances to customers on those same schemes and still have to deliver, despite being late. This is especially pertinent in the context of poor AMP7 delivery performance sector-wide and worsening exogenous risk factors.

129. The size of the AMP8 capital programme is primarily driven by the changing regulatory environment which subjects us to stricter environmental standards and other statutory requirements.

130. The majority of our programme targets performance improvements required by statutory obligations. As a result, failure to deliver schemes in AMP8 would incur fines from other regulators, such as EA and DWI, for failing to meet standards, whilst also incurring financial penalties associated with PCD clawback and late delivery under the FD. Ofwat did not fully consider how regulatory fines interact with the regulatory framework and the risk that PCDs could clawback allowances and regulators could issue fines for non-delivery in relation to the same scheme. This is especially relevant where our regulators have expanded powers to issue greater fines.

131. The delivery risk associated with PCDs is compounded by the introduction of the Delayed Delivery Cashflow Mechanism (**DDCM**) in the FD which is potentially duplicative with PCDs and includes overlaps between its regulatory mechanisms and other statutory obligations. DDCM is at the enhancement totex level and applies in-period while PCDs are scheme level and applies end-of-period. Where a DDCM clawback is triggered, it is not clear how Ofwat will manage these differences to adjust the assessment of PCD clawbacks to avoid duplication.

132. For more detail on all these errors, please refer to Chapter 5: Price Control Deliverables.

6.3. Stretching and punitive outcomes package

133. The errors in the outcomes calibration and design impact our risk ranges as demonstrated in the total results and the design risk considered previously above (see Results of our risk analysis).

134. The FD set very stretching ODI targets with high ODI rates which can be expected to create financial underperformance that has not been adequately protected against by caps, collars and deadbands. Stretching targets introduce expected net penalties in the P50 scenario while high rates amplify the existing impact. High rates compound the risk introduced by stretching PCLs impacting worsening downside risk and limiting the potential upside.

135. The set PCLs reflect a material degree of stretch against current performance levels and are unlikely to be achieved given the lag between project funding, completion, and performance improvement.[33] The FD also did not adequately consider changes to ODI definitions and how these changes increase the gap between current performance and the performance expected by the PCLs.

136. Excessive stretch was included across many PCLs but is most significant in our CRI and total pollutions targets. Reportable pollution incidents now include those occurring due to a named storm, which were previously excluded prior to FY23 by the EA. This exacerbates the stretch in the PCL set at the FD.

137. High ODI rates compound the impact of stretching PCLs. The FD approach to ODI rates used arbitrary starting points of 0.5% per ODI for regulated equity at risk in its calculation of ODIs, which resulted in excessively punitive ODI rates that create asymmetric risk. There are 9 common PCs in water and 8 in wastewater and thus the gross starting calibration of the ODI package is 4% and 5.5% respectively before Mex's and cross-price control ODIs. This is an extremely large exposure for a regulated utility business to place on a sub-set of its service. There is also a disconnect between the relative size of the starting regulated equity at risk and the priorities of our customers.

138. The FD does not adequately consider the impact of extreme rare events on performance. Wastewater ODIs, like pollution incidents and storm overflows, are strongly influenced by rainfall. Extreme weather events could induce material underperformance which is outside of our control. Our underperformance against AMP7 water supply interruptions targets was predominantly driven by a few standalone events, with our underlying performance being much closer to the targeted level.

139. Mitigating caps, collars, and deadbands were introduced to address extreme performance outcomes. However, these mitigation measures were not applied systematically without a sufficient rationale. For example, collars on water supply interruptions and pollutions were set wider than other ODIs and no collar was set on certain ODIs like CRI or leakage.

140. Performance may be penalised twice due to the overlap between ODI performance targets and targets set by other regulators. For example, the EA penalises the occurrence of pollution incidents and serious pollution incidents separately from the PR24 framework. We do not dispute the importance of reducing incidents, however duplicative penalties risk cashflow availability for performance-improving investment.

141. For more detail on these errors, please refer to Chapter 6: Performance Commitments and Outcome Delivery Incentives.

6.4. Delivery mechanism

142. Ofwat introduced a number of delivery mechanisms at AMP8 to support companies in their delivery obligations amongst uncertainty and increasing levels of risk.

143. This risk is built into the totex line of the results presented previously and are explicitly captured based on the higher risk enhancement totex carries outside of the large gated schemes. Our modelling specifically assigns programmes to enhancement, enhanced engagement cost sharing, and large-gated scheme as each delivery mechanism results in a different risk allocation.

144. We identified a number of schemes that were not correctly assessed to the most appropriate delivery mechanisms. The water resilience scheme included five water treatment works that

[33] KPMG, January 2025, PR24 Final Determinations – risk analysis for a notional company, page 53, SOC-1-0001.

needed significant investment and was posed to Ofwat as a single programme. The programme was divided and two of the sites were included in the large-gated scheme and three were not. By misallocating the schemes to enhancement outside of the large-gated scheme, our risk has increased.

145. Separate from the large gated scheme issues was the introduction of the Delivery Mechanism of contingent funding in AMP8. A portion of our allowances is included under a delivery mechanism where we must request funding from Ofwat mid-AMP to deliver against statutory requirements. We do not agree that the delivery mechanism in its current form is appropriate for supporting the delivery of statutory requirements. Should Ofwat reject our request, this could mean we fail to comply with our regulatory requirement due to lack of allowance provided.

146. Our regulators could determine material penalties for non-compliance. Ofwat does not plan to update the allowances within the delivery mechanism to take into account the latest information on costing, which may introduce a material cost gap. This risk is not modelled but is expected to increase our cost performance risk by increasing the size of the programme and increase our delay risk as we can only access funding and thereby begin work mid-AMP.

147. For more detail on these errors, please refer to Chapter 4: Treatment of Uncertainty Through Mechanisms.

6.5. Financing

148. The FD underfunded the allowance for the cost of debt because of flaws in the methodology used and had insufficient consideration for basis risk to which even an efficient, notional company operating in the sector would be exposed in practice.

149. This contributes to the financing risk P50 results where our embedded debt risk is underfunded through the allowances, and the combination of risk on new debt and inflationary risks result in a materially wider range both a worse P10 and better P90 than Ofwat's ranges.

150. The FD allowance for cost of embedded debt did not recognise the debt make-up of the sector by excluding swaps and assuming a debt mix not reflective of companies in the sector. It also assumed that debt costs are driven solely by factors within a company's control, which is not the case in practice.

151. The new debt allowance is anchored to the iBoxx A/BBB benchmark + 30bps. Companies have persistently underperformed against the iBoxx and the 30bps uplift does not adequately cover the sector-wide delta, especially in the context of more recent debt issuances. See Chapter 7: Weighted Average Cost of Capital (see the section on cost of debt).

152. The FD share of new debt is calculated on an inconsistent basis as it combines embedded debt at actual company gearing and new debt at notional gearing. It also does not reflect RCV growth on a basis that is consistent with the relative size of the capital programme we must deliver in AMP8.

153. The FD set allowances on CPIH terms and assumed an RPI-CPIH wedge of 90bps. There is currently limited availability of CPIH debt and therefore an efficient company must rely on RPI and CPI debt. In this context, the FD approach ignored (i) the wedge between CPI and CPIH, and (ii) the potential fluctuations in the RPI-CPIH wedge, which could have substantial impact on performance vs allowance given that the majority of index linked debt in the sector is tied to RPI.

154. The FD allowance for cost of carry understates the scale of pre-financing typically undertaken by the sector and is below pre-financing levels implied by cash on company balance sheets over AMP7.

155. For more details on these errors, please refer to Chapter 7: WACC.

6.6. Risk mitigations

156. The FD includes a range of risk mitigations designed to limit the range of possible outcomes and therefore provide more financial certainty to customers and investors. However, these mitigations are inadequate, do not sufficiently address the miscalibration in the FD, and result in an allocation of risk to the appointee which is too severe.

157. Each of the risk mitigations listed were included in the risk modelling as prescribed in the FD with any exceptions noted.

6.6.1. Totex

158. Ofwat introduced several totex risk mitigations at the FD that work well to eliminate risk, however they do not sufficiently limit the worst case scenario risk or the base case scenario risk.

159. Firstly, some risk mitigations for enhancement totex work well and were widely applied, however the most effective cost sharing rates and gated scheme status were reserved for limited components of the totex programme. The mitigations included in AMP8 for the enhancement totex programme are listed below with the proportion of the programme they cover including both well applied and insufficient mitigations:

- Cost sharing rates on enhancement lowered from AMP7 50% to AMP8 40% of retained risk, this was applied to the entire enhancement programme, this was effective but not sufficient to limit downside risk;
- Enhanced engagement cost sharing (EECS) provides better protection with 25% retained risk on over- and under-spend, this was effective but was only applied to ~2% of the capital programme and was not sufficient to limit downside risk;
- Large gated schemes provide 6-12% development costs allowances first and releases the remaining allowances over time as more certainty is obtained in addition to enhanced cost sharing rates at 25% retained risk. The KPMG analysis indicates that 55% of typical overruns are in the design phase, which would be mitigated by gated schemes.[34] This was a very effective risk mitigant but applied to only ~14% of our capital programme and was not sufficient to limit downside risk; and
- RPEs on enhancement totex labour and materials was applied to the entire enhancement programme, this was effective and does limit our risk from uncertainty like supply chain pressures.

160. Ofwat only included schemes in the Large Gated Scheme mechanism "w*hen an enhancement scheme's requested value is greater than £100 million and where we have concerns around scope, cost, deliverability, complexity or if schemes involve novel elements or complex technologies*".[35] This limits the potential risk protection as schemes that do not meet the size threshold but still carry material uncertainty are excluded. The risks protected by the large-gated schemes are not unique

[34] KPMG, January 2025, PR24 Final Determinations – risk analysis for a notional company, page 28, SOC-1-0001.
[35] Ofwat, February 2025, PR24 final determinations: Expenditure allowances, page 316, SOC-1-0006.

to large schemes. Exogenous risks could be controlled if the gated process was applied more widely.

161. While the cost sharing rates were significantly improved including the EECS and large gated schemes, they are symmetrical while the underlying cost performance risk is asymmetrical. Cost performance risk is inherently asymmetric, and this asymmetry cannot be corrected by symmetrical risk mitigations like cost sharing rates. Symmetric risk is a necessary assumption of the CAPM and by not allocating a symmetric risk profile, Ofwat introduces negative skew which is not priced into the cost of capital.

162. Base totex also relies on cost sharing rates of 50% and a suite of RPEs covering energy and labour costs, however similar to enhancement totex risk the net risk remains asymmetric to the downside. This contributed to the asymmetry in the FD risk allocation and is not compensated through the allowed cost of capital. Energy cost risks addressed by the RPE are captured by adjusting out the energy costs from historical data upon which calculations are based. Other RPEs were not captured due to data limitation issues.

6.6.2. ODIs

163. Ofwat recalibrated the outcomes package between DD and FD, introducing a number of risk mitigations. However, the underlying risk on ODIs arises from the skew in the overall package which is not fully addressed by these measures.

164. Ofwat's mitigations have helped address some of the skew in each of the underlying individual ODI's design but have not eliminated all of the skew. The below outlines each key mitigation applied and the associated degree of effectiveness at mitigating outcomes risk:

- Deadbands were applied to all penalty-only and some standard ODIs to reduce base case scenario expected net penalties. This was effective at reducing base case risk but in some cases the deadbands were too small to fully eliminate expected net penalties;

- Caps and collars were more widely applied to provide a limit on out- and under-performance. Ofwat also applied collars to many ODIs with no corresponding cap. This was effective at balancing the upside potential to the downside risk, however many of the collar levels were set too high and some ODIs were left with no collar. The upside is naturally limited by the degree of stretch but in most cases downside risk is not well limited except by collars;

- Recalibrated PCLs based on outturn performance in AMP7 were used for a subset of ODIs reducing base case expected penalty from calibration risk. This was effective on the ODIs Ofwat recalibrated but in some cases was not effective as it still did not take into account company specific characteristics and not all ODIs were recalibrated; and

- Outturn Adjustment Mechanism (OAM) adjusts outcomes RoRE for the sector based on the median performer's RoRE outside of the ±50bps deadband. This is not effective and not likely to correct for expected base case penalties due to the presence of the deadband.

165. Taken together, these risk mitigations helped to remove some skew in the overall outcomes package from the Draft Determinations but leaves a considerable amount of downside risk. In particular, these measures do not make the ODI outcomes range symmetric, a necessary assumption of the CAPM, due to asymmetry between penalty-only ODIs and ODIs with limited scope for outperformance due to physical constraints. In some cases, caps are not achievable because of physical constraints but collars are achievable, driving more asymmetric outcome risk ranges.

166. Calibration of risk mitigations on outcomes does not sufficiently consider the interrelationships between PCs. For example several wastewater ODIs are all driven by rainfall.[36] Combining the collars across these ODIs[37] gives a potential downside outcome of -2.45% RoRE. This scale of this penalty is enough to challenge financeability.

167. The OAM provides insufficient base case protection, allowing for a material degree of ODI package expected base case before correcting. It also does not protect against the negative base-case risk arising from skew in specific ODIs. The inclusion of a deadband of ±50bps results in the vast majority of the skew in outcomes remaining unaddressed. The mechanism is intended to protect against material miscalibration of PCLs across the sector, however, it is not meant to be a substitute for correct ex ante calibration. Based on the errors identified, we are concerned that the ex-ante calibration errors will not be fully resolved by the OAM. Where companies have unique characteristics which are not captured in the calibration of incentives (targets and rates), the company performance would be expected to be below the median and therefore not expected to be corrected back to 0% RORE.

6.6.3. ASM

168. The ASM provides risk mitigation for worst case scenario risks from exceeding very high thresholds, however the thresholds are too high and do not support financeability.

169. The combined ASM package left scope for potentially 500bps RoRE (c.£182m p.a.) underperformance before any protection is afforded. This was based on the policy decision by Ofwat to leave the entire cost of equity at risk. Totex ASM provides no protection up to ±200bps RoRE (c.£73m p.a.). The Outcomes ASM provides no protection up to ±300bps (c.£109m p.a.). There is no connection between these thresholds and the financeability assessment. These thresholds do not support financeability in the plausible downside scenarios and means we may not be able to maintain Baa1/BBB+ credit ratings.

170. The Totex ASM was also designed inconsistently with the Outcomes ASM. The Totex ASM considers wholesale totex across both water and wastewater price controls. The Outcomes ASM separates ODIs between water and wastewater price controls. It is not consistent and may confer advantages and disadvantages to companies based on whether they are a water only company (**WoC**) or water and sewerage company (**WaSC**). As a result, the ASM did not protect against a material erosion of the allowed return nor headroom to maintain at least Baa2/BBB negative outlook and thus financeability. For more details, please refer to Section 6 Financeability assessment.

[36] KPMG, March 2025, Impact of exogenous risk factors on wastewater ODI performance, page 25, SOC-1-0004.
[37] These ODIs include total pollution incidents, external sewer flooding, internal sewer flooding and storm overflows.

7 Financeability assessment

171. This section assesses financeability of a notional company operating in our region, given the allowed return and risk exposure under the FD and given the risk analysis set out in the previous sections.

172. We find a number of errors and shortcomings with the financeability assessment in the FD and set out how to robustly assess financeability in respect of both debt and equity. Our assessment is undertaken using an objective, appropriate framework informed by investor considerations in practice.

7.1. Introduction

7.1.1. The market and macroeconomic environment

173. We have a significant requirement for new capital – both debt and equity – in PR24, significantly in excess of that required in PR19. This requirement is driven by the scale of our investment programme. The vast majority of our enhancement investment programme is driven by statutory obligations. In order to be able to deliver outcomes for customers, it is critical that we are able to raise the new capital required, and at an efficient cost.

174. Investor sentiment towards the UK water sector is negative, including perceptions of the stability and predictability of the regulatory framework, having deteriorated significantly in recent years.

175. Throughout the PR24 process, equity and debt investors expressed concerns in relation to risk, return and the level of allowed investment.[38] An investor survey conducted by Barclays found that UK water is perceived to be the riskiest regulatory regime across the main European markets.[39] Uncertainty around the regulatory regime, for example as a result of the Cunliffe review, may further increase the perception of risk in the sector beyond the calibration of the regulatory determination itself.

176. PR24 is also occurring in a more challenging macroeconomic environment than PR19, with interest rates (and therefore the cost of debt) having risen materially. Financial market conditions are characterised by heightened uncertainty and increased volatility.

177. Investors have many opportunities to deploy capital beyond UK water, including other regulated sectors, non-regulated sectors and markets outside the UK, where there is significant competition, including in respect of the energy transition. Based on the FD, yields available to equity in the water sector are also insufficient compared with yields on senior corporate debt.

178. It is critical that both the allowed return and risk exposure faced by a notionally efficient company operating in our region is allocated appropriately, taking into account sentiment towards the broader water sector, investment opportunities elsewhere and investor expectations in respect of the risk exposure of a regulated utility.

7.1.2. Risk / return calibration

179. There is a critical correspondence between risk and return – investors consider returns on a risk-adjusted basis, taking into account the expected (P50) outcomes, and the overall magnitude of risk faced relative to the allowed return. For a regulated utility sector like UK water, investors commit

[38] Global Infrastructure Investor Association, August 2024, GIIA's response to: Ofwat's PR24 Draft Determinations, page 5, SOC-1-0010.
[39] Barclays, November 2024, UK Water - Rating agencies and investor survey: all about contagion , page 7, SOC-1-0011.

capital on the basis of risk exposure being relatively low. Irrespective of return, some pools of capital are simply not able to invest in higher-risk assets. For example, some equity infrastructure funds may be restricted to core/core-plus infrastructure.

180. If the expected risk-adjusted return for the notional company is too low, or negative, or below that on offer elsewhere for investment opportunities with comparable or lower risk, or if an excessive proportion of the allowed return is put at risk, then the company's ability to raise capital and deliver for customers is undermined.

181. In order to set the right level of risk and return, a robust assessment of financeability must be based on an objective assessment of risk exposure, and appropriate consideration of debt and equity positions must be based on that assessment.

7.2. Debt financeability

7.2.1. Investor considerations

182. Debt investors commit capital on the basis of, amongst other things, credit ratings. There are distinct pools of capital for investment-grade and for riskier, speculative debt, where the former is typically also included within a broader range of market indices.

183. Within the market for investment-grade debt, market capacity is typically reduced at lower ratings (particularly Baa3/BBB-) as the proximity to speculative debt ratings threshold increases the risk they may become forced sellers of their investment to comply with their investment mandate. When debt investors consider whether to commit capital (and if so, at what cost) to the notional company, headroom within the expected rating and downside exposure are significant factors in their decisions.

184. Broadly speaking, credit rating agencies assess credit quality on the relative strength of business and financial risk profiles. For UK regulated utilities, business risk profile is significantly affected by the regulatory framework, as regulatory price determinations effectively set major operating parameters – in the case of water: totex, cost of capital, risk exposure and performance commitments. Historically, Moody's, S&P and Fitch have considered the business risk exposure of UK regulated utilities to be relatively low, which, in turn, allows credit metric thresholds to be less stringent than otherwise might be the case. In that context, Ofwat's regulatory framework is critical to supporting financeability.

185. During the PR24 process, credit rating agencies raised concerns about the supportiveness of the regulatory framework. In November 2024, Moody's Ratings downgraded its assessment of the stability and predictability of Ofwat's regulatory framework from 'Aa' to 'A', reflecting a perceived deterioration in the water sector's business risk profile.[40] Consequently, it reduced its opinion of the industry's debt capacity and tightened credit metric thresholds, such that to maintain credit quality, a company would need to achieve lower gearing and higher interest cover ratios. It noted that:

> *"This assessment reflects a continuing trend of negative public perception resulting in more regulatory powers, an increased focus on enforcement action, demanding targets, greater penalties for operational underperformance and growing regulatory complexity that, in turn, result in higher cash flow volatility and leaner returns. All of these factors are leading to an environment that is less supportive of the water utilities' operations and, therefore, credit negative."*

[40] Moody's ratings, November 2024, Reduced predictability of regulatory environment pressures credit quality, SOC-1-0012.

186. In February 2025, Standard & Poor's downgraded its assessment of 'preliminary regulatory advantage', its assessment of Ofwat's regulatory framework, from 'strong' to 'strong/adequate', reflecting its perception of a less supportive regulatory environment, specifically in relation to regulatory stability, financial stability and regulatory independence.[41] It now assesses the regulatory framework as less supportive than that of Ofgem and energy regulators in Western European countries, including France, Italy, Ireland and Sweden, as well as the Czech Republic. In view of the weaker business risk profile, S&P significantly tightened credit metric thresholds for the typical company.

187. In November 2024, Fitch Ratings indicated that it could reduce the debt capacity of water companies in light of increased sector risk.[42] In rating actions published in February 2025, it confirmed its view of higher business risk in AMP8 taking into account FDs, driven by "*heightened exposure to environmental risk, increasing public scrutiny, and higher clawback risk*".[43] As with Moody's and S&P, Fitch reduced its opinion of debt capacity for the sector and tightened credit metric thresholds.

7.2.2. Ofwat's financing duty

188. Section 2 of the Water Industry Act 1991 sets out that Ofwat's financing duty is to (emphasis added):

> *"…secure that water companies can (in particular through securing reasonable returns on their capital) finance the proper carrying out of their statutory functions."*

189. Ofwat's financing duty is not defined with reference to debt but all financing, and therefore equity financeability must also be considered, including the risk-absorbing capacity of equity, which is critical to supporting debt financeability.

190. An assessment of debt financeability is also an important cross-check on the cost of equity, as recognised by the CMA in the CMA PR19 Redetermination.

191. If the allowed cost of capital in the FD is assumed to represent Ofwat's estimate of reasonable returns on capital for the notional company, it follows that in respect of debt financeability, the notional company should be able to achieve the allowed cost of debt (in respect of both embedded and new debt), otherwise the FD cannot be considered financeable.

192. In respect of new debt, Ofwat estimated its allowance based on the return on the average of A/BBB iBoxx non-financial corporate debt indices and a calibration adjustment of 30bps. The average debt rating of the combined constituents of those indices is materially above the target credit rating of Baa1/BBB+ assumed as part of the FD financeability assessment. Therefore, to have some prospect of being able to achieve the allowed cost of new debt (before considering the insufficiency of the calibration adjustment, as set out in the section on cost of capital), the notional company must be able to achieve, as a minimum, an expected Baa1/BBB+ rating.

193. If the notional company were not able to achieve the target rating, the notional company would be expected to underperform the cost of debt allowance – that underperformance would implicitly be borne by equity investors and therefore, absent any mitigation, could also adversely impact equity financeability. Furthermore, any underperformance on cost of debt would lead to a higher

[41] S&P Global, February 2025, U.K. Water Regulatory Framework Support, Low Financial Flexibility in Coming Regulatory Period Drive Rating Actions, para 4, SOC-1-0013.
[42] Fitch ratings, November 2024, FD for AMP8 Will Be Crucial for De-Risking UK Water Sector, para 3, SOC-1-0014.
[43] Fitch ratings, February 2025, Fitch Revises Osprey Acquisition's Outlook to Negative; Affirms Anglian Debt at 'A-', para 5, SOC-1-0015.

embedded cost of debt in future periods, and consequently, challenge longer-term financeability or result in higher future customer bills.

194. Beyond the necessity for the notional company to be able to achieve, as a minimum, an expected Baa1/BBB+ rating in respect of the cost of new debt allowance, there has been an increasingly prescriptive approach to ratings adopted by Ofwat. For example, the licence-based cash lock-up threshold has been revised upwards to Baa2/BBB from Baa3/BBB- (both with negative outlook). Consequently, equity investors' perceptions of the risks around dividends have increased. This underlines the importance of credit ratings for financeability, and therefore the significance of rating agencies' assessment of increasing business risk.

7.2.3. Errors in the FD financeability assessment

195. In the FD, Ofwat assessed debt financeability for the notional company on the basis of key credit rating agency metrics, namely Moody's Adjusted Interest Coverage Ratio (**AICR**) and S&P Funds from Operations (FFO) / Net Debt ratios, and significant assumptions around capital structure and performance. Ofwat did not assess Fitch's credit metrics, despite the agency rating the majority of companies in the sector.

196. The debt financeability assessment in the FD did not fully or appropriately consider the impact of the rating agencies' reassessment of business risk in the sector. The AICR was assessed against the tightened minimum threshold for Baa1 of 1.6x, as set out in Table 11, however FFO / Net Debt was assessed against the then minimum threshold for BBB+ of 9% (as at the time of the FD), despite S&P having signalled in November 2024 that it may revise its thresholds upwards.

197. As set out in Table 11, S&P significantly tightened the minimum FFO / Net Debt threshold for BBB+ to 11%, as a consequence of moving from the 'low' to 'medium' volatility benchmark table for the assessment of cash flow and leverage.

198. Table 11 below sets out the credit metrics in the FD (AMP8 average as calculated by Ofwat) and the relevant thresholds for the notional company before and after revision due to the rating agencies' reassessment of business risk in the sector.

Table 11: Ofwat's assessment of AMP8 credit metrics and the relevant thresholds

Credit metric	Ofwat FD calculation	Prior to revision	After revision
Moody's AICR:	1.70x		
Baa1		1.5 – 1.7x	1.6 – 1.8x
Baa2		1.3 – 1.5x	1.4 – 1.6x
Baa3		Not published	1.2 – 1.4x
	9.80%		
S&P FFO / Net Debt:			
BBB+		9 – 11%	11 – 14%
BBB		6 – 9%	8 – 11%
BBB-		4 – 6%	6 – 8%

Note: Ofwat's assessed credit metrics taken from Table 8 of the 'Aligning risk and return - Risk and return appendix', for FFO / Net Debt, the 'alternative' basis is presented, being more aligned to the S&P's actual ratio calculation.

199. Even before considering errors in the FD debt financeability assessment approach, it can be seen from the table that the notional company would not be able to achieve a BBB+ rating with S&P applying its tighter FFO / Net Debt thresholds.

200. The debt financeability assessment in the FD made several material errors set out below.

7.2.4. 1. Misspecification of the capital structure

201. Ofwat's assessment assumed 90% of opening index-linked debt would be linked to RPI despite the move to full CPIH indexation of RCV from the start of AMP8 and the lack of any allowance for RPI-CPIH basis risk in the allowed cost of debt. A notional company would be expected to have transitioned all its RPI-linked debt to a CPI(H) basis by the start of AMP8 to mitigate unremunerated RPI-CPIH basis risk.

202. The impact of the misspecification of the opening index-linked debt assumption was to overstate the AICR as the cash interest cost of RPI-linked debt is lower than that of CPI(H)-linked debt due to the RPI-CPIH wedge (assumed by Ofwat to be 90bps in its assessment).

203. The assessment of debt financeability in the FD assumed actual cost of debt for the notional company to be the same in each year (in line with the allowance), whereas the actual cost of debt would be expected to increase over AMP8 due to the proportion of new debt increasing over time and the cost of new debt being higher than the cost of embedded debt.

204. The impact of not appropriately modelling the profile of cost of debt for the FD assessment was to overstate credit metrics in later periods and understate them in earlier periods, which may have implications given that rating agencies assess not only average metrics, but the annual profile of metrics.

205. Furthermore, Ofwat's assessment of financeability also assumed notional gearing of 55%, below the 60% level we consider appropriate, as set out in Chapter 7: WACC in relation to cost of capital.

7.2.5. 2. Lack of consideration of risk exposure

206. In assessing credit quality, both debt investors and credit rating agencies consider expected performance of a company against its regulatory determination, including plausible downside risk. For the notional company, the FD debt financeability assessment assumed neutral operational and financing performance against its allowances, including that the actual cost of debt would be in line with that allowed. Robust risk analysis, as set out above (see 4.7 Results of our risk analysis), indicates expected (P50) performance equivalent to -3.75% RoRE (on an economic basis considering reconciliation mechanisms) for a notionally efficient company operating in our region, which cannot be ignored when assessing what credit rating the notional company would be able to achieve.

207. The impact of Ofwat's assumption was to materially overstate credit metrics relative to how debt investors and credit rating agencies would assess them in practice on a forward-looking basis.

208. Furthermore, Ofwat's assessment did not consider any robust downside analysis informed by risk exposure, for example at P10 level. Consequently, the assessment could not give any reasonable view on financial resilience of the notional company under the FD, particularly against licence-based thresholds, for example cash lock-up at Baa2/BBB (negative outlook).

7.2.6. 3. Inadequate and downward-biased assessment of credit metrics

209. Credit metrics were assessed against the lower thresholds for Baa1/BBB+, in the case of S&P, against thresholds that have been revised upwards since the FD, where it had signalled it was likely to do so in November 2024.

210. The assessment in the FD did not consider the upper or mid-point thresholds for the target rating level, nor undertake any assessment that rating headroom was appropriate, having not undertaken any robust downside analysis, as set out above. That is a flawed interpretation of rating agency methodologies, particularly so where business risk is perceived to be increasing as a result of regulatory decisions, and therefore it is prudent to maintain greater headroom in view of reducing debt capacity.

211. The impact of the assessment approach in the FD was to overstate implied ratings, particularly in respect of S&P, where the notional company would be unable to achieve a BBB+ rating, even before considering the impact of the other errors in Ofwat's approach.

212. Furthermore, in its financeability assessment, Ofwat only considered average credit metrics across AMP8, without giving consideration to the annual profile. While rating agencies assess average metrics on a forward-looking basis, they also consider the annual profile, particularly where there is a downwards trend, suggesting deteriorating credit quality.

213. In such a situation, even where projected metrics were to remain above minimum thresholds for the rating, rating agencies may consider assigning a negative outlook in the absence of a basis on which to conclude metrics would recover in future periods beyond the assessment horizon, or where they view operational or financing risk exposure to be increasing over time.

214. Where a rating has a negative outlook that is not expected to be stabilised imminently, investors may price new debt at or closer to the level implied by a rating one notch lower, implying a higher cost of debt. Where the notional company was rated Baa2/BBB with one or more agency, a revision of outlook from 'stable' to 'negative', even if only transiently, would be sufficient to trigger a dividend lock-up under the licence, illustrating the heightened risks to equity.

7.2.7. 4. Assumption of new equity capital without any analysis or evidence in support

215. Ofwat's assessment assumed significant new equity, totalling £1.8bn would be injected to reduce opening gearing to 55% and maintain it broadly in line with that assumption, without undertaking any assessment of whether the notional company would be able to attract that equity. Such an assessment must consider the allowed return and risk exposure implied by the FD.

216. The impact of the mis-specified assumption was to overstate the credit metrics, particularly FFO / Net Debt. More broadly, this implied a level of support to debt financeability (from the risk-bearing capacity of equity), which was overstated.

7.2.8. An appropriate approach to assess debt financeability

217. An appropriate approach to assessing debt financeability, correcting the errors set out above, could be summarised in two tests:

- The notional company should be able to achieve expected credit metrics commensurate with a well-positioned Baa1/BBB+ rating in view of the assumptions underpinning the cost of new debt allowance, utilising appropriate assumptions on capital structure and expected (P50) performance; and
- The notional company should have sufficient headroom, such that it would be resilient to severe, but plausible downside risk (P10), where resilience is defined by its ratings remaining above Baa2/BBB (negative outlook).

218. In respect of the second test (2), testing resilience for the notional company with respect to a lower rating is not considered appropriate in view of the quantum of new debt capital required in AMP8 and significantly higher cost at Baa3/BBB- compared to at the implied rating underpinning the cost of new debt allowance.

219. Furthermore, assessing financial resilience against Baa2/BBB (negative outlook) is consistent with the amended licence cash lock-up requirement, below which Ofwat considers companies to be exposed to:

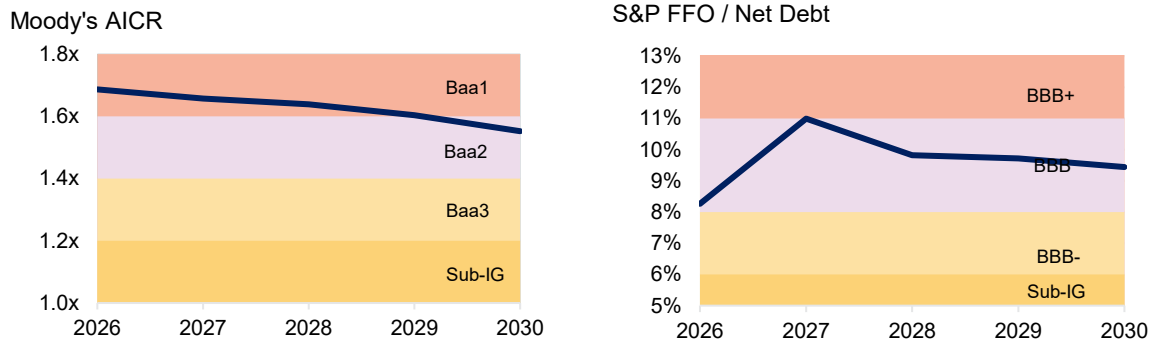
> *"…unnecessarily higher levels of risk and potentially […] insufficient headroom to absorb unexpected shocks including, for example, outcome delivery incentive underperformance payments and enforcement penalties (such as fines for breaches of environmental law) or to fund any major turnaround plans, if required."*[44]

220. In both cases, credit metrics should be assessed considering the cashflow impact of risk exposure before any end-of-period economic reconciliation mechanisms, given that is the basis on which those metrics are calculated. Furthermore, in respect of any realised underperformance implied by risk exposure, it must be funded by new capital raised by the notional company during AMP8, whether debt or equity, or both.

7.2.9. Assessment of debt financeability before considering risk exposure

221. Figure 3: Annual profile of credit metrics assuming all AMP8 opening index-linked debt linked to CPIH and an actual cost of debt in line with the allowance, but reprofiled annually below shows the annual profile of AICR and FFO / Net Debt after correcting for error 1 (misspecification of the capital structure) and error 3 (inadequate and downward-biased assessment of credit metrics), but before considering risk exposure (error 2) and related to that, the unevidenced assumption of new equity (error 4). The actual cost of debt has been modelled on the basis of the FD allowance but using an annual profile of the proportion of new debt and the cost of embedded debt. Although we do not believe the assumption of 55% notional gearing is appropriate, for the purpose of this assessment, we have adopted that assumption for consistency with the FD cost of capital.

Figure 3: Annual profile of credit metrics assuming all AMP8 opening index-linked debt linked to CPIH and an actual cost of debt in line with the allowance, but reprofiled annually



Source: analysis of credit metrics undertaking using Ofwat financial model, with changes to functionality made to facilitate use of assumptions and approach set out above.

[44] Ofwat, July 2022, Consultation under sections 13 and 12 A of the Water Industry Act 1991 on proposed modifications to strengthen the ring-fencing licence conditions of the largest undertakers, SOC-1-0016.

222. Note: AICR calculated excluding the impact of revenue reprofiling and FFO / Net Debt on the 'alternative' basis, both being more aligned to actual methodologies. Both ratios are presented on the basis of the FD including the delivery mechanism.

223. Figure 3 above shows that, even before considering risk exposure and equity financeability, the notional company would not be able to achieve the BBB+ target credit rating with S&P and would be weakly positioned at Baa1 with Moody's, particularly given the AICR falling below threshold in 2029/30. That the notional company is not able to achieve the target credit rating under those assumptions implies that the cost of equity set out in the FD is materially insufficient to ensure financeability.

224. To illustrate the lack of financial resilience shown in Figure 3, Table 12 below sets out the results from reverse stress testing of the notional company in respect of just one significant risk, totex underperformance. It shows the average degree of totex underperformance the notional company would be able to bear against the AICR and FFO / Net Debt minimum thresholds for each rating, expressed in RoRE terms and before considering end-of-period sharing that would not support in-AMP metrics.

Table 12: Average totex underperformance headroom (% of RoRE) to minimum threshold for each rating

Rating	Moody's AICR	S&P FFO / Net Debt	
Baa1 / BBB+		0.3%	N/A
Baa2 / BBB		2.7%	3.4%
Baa3 / BBB-		5.3%	7.7%

Source: analysis of credit metrics undertaking using Ofwat financial model, with changes to functionality made to facilitate use of assumptions and approach set out above.

225. Note: headroom calculated for base and enhancement totex against AMP-average metrics, on the same basis as Figure 3.

226. As shown in Table 12 above, headroom against Baa1 is very low, on average, and likely close to zero taking into account the deteriorating AICR profile over AMP8. Headroom to Baa2/BBB is also small and insufficient even to absorb the P50 risk exposure on totex of -2.6% RoRE (on a cashflow basis), presented in 4.7 Results of our risk analysis, above.

227. Table 12 demonstrates the lack of headroom to totex underperformance, even before considering downside totex risk at P10 or other operational and financing risks.

7.2.10. Assessment of debt financeability considering risk exposure

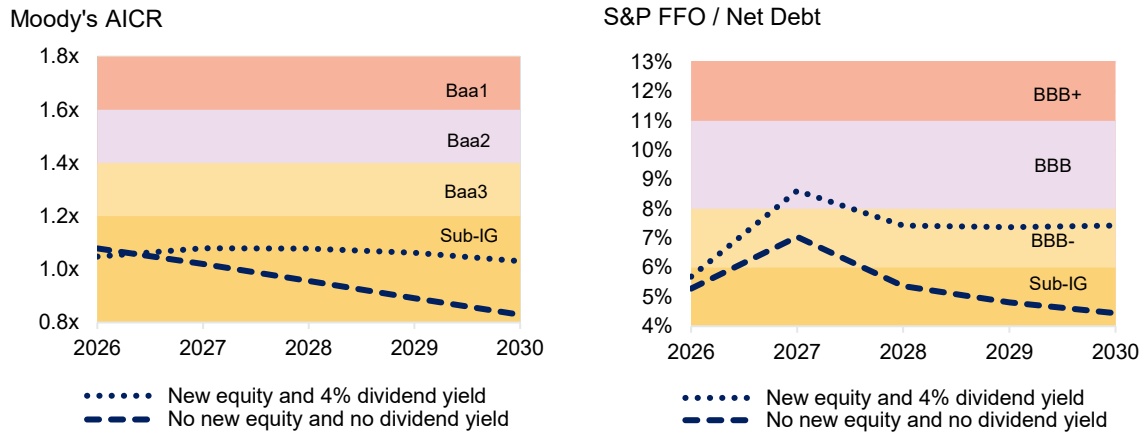
228. Figure 4 further below sets out the annual profile of AICR and FFO / Net Debt after correcting for errors 1-4, presenting those metrics both with and without the assumption of new equity during AMP8 to maintain notional gearing in line with 57.5%.

229. The other assumptions made are as follows:

- All AMP8 opening index-linked debt linked to CPIH;
- Expected operational performance in line with P50 risk position on a cashflow basis excluding the impact of post-period reconciliations (equivalent to average -6.36% RoRE), as set out above, for example in respect of wholesale totex cost sharing and true ups from RPEs, the ASM and PCDs;

- Performance on ODIs and other incentives assumed to be reflected in RCV for the subsequent period, and therefore no impact on revenue and cashflow in AMP8;
- Cost of embedded debt based on the sector average all-in cost of embedded debt and a 11bps adjustment in respect of swaps;
- Cost of new debt in line with the P50 risk position against the FD cost of new debt allowance (35bps underperformance);
- Where no new equity is assumed to be forthcoming, no dividends have been assumed as a mitigant; and
- We have not varied the notional gearing assumption from 55%, as set out in the preceding section.

Figure 4: Annual profile of credit metrics correcting for errors 1-4 on a P50 basis



Source: analysis of credit metrics undertaking using Ofwat financial model, with changes to functionality made to facilitate use of assumptions and approach set out above.

230. Note: AICR calculated excluding the impact of revenue reprofiling and FFO / Net Debt on the 'alternative' basis, both being more aligned to actual methodologies. Both ratios are presented on the basis of the FD including the delivery mechanism.

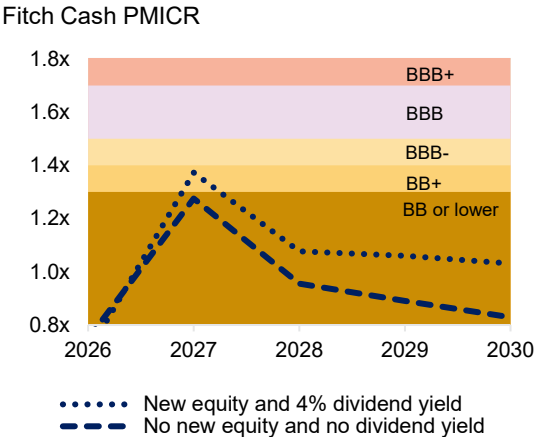
231. Figure 4 above shows that under realistic assumptions and assuming expected performance in line with P50 risk exposure, the notional company would only be able to achieve a weakly positioned BBB- rating with S&P and not achieve an investment-grade rating with Moody's, even assuming new equity would be forthcoming (£3.8bn would be required for the notional company to maintain 55% gearing, including the required opening de-gearing).

232. Given the lack of any assessment by Ofwat demonstrating equity financeability before considering risk exposure and given an expected (P50) risk-adjusted return of only 1.21% (CPIH-real, economic basis after considering reconciliations), the notional company would not be able to attract requisite new equity under the FD on a P50 basis.

233. Equity cannot be expected to act as a substitute for an appropriate risk and return calibration, nor as a 'cure' for a credit rating that cannot otherwise be achieved. Equity also has only a modest impact on interest cover metrics like Moody's AICR which is driven by in-year cashflows rather than balance sheet effects.

234. Figure 5 below set outs the key cashflow-based credit metric for Fitch, its cash Post Maintenance Interest Cover Ratio (**PMICR**), on the same basis as Figure 4 above, against the respective thresholds for the issuer-default rating (**IDR**) for the notional company, having tightened those thresholds following the FD. A notional company would typically be assigned a senior unsecured debt rating (comparable to the Moody's and S&P ratings modelled above) one-notch above the IDR, unless the recovery prospects for credit were assumed to be weaker than average.

Figure 5: Annual profile of Fitch cash PMICR correcting for errors 1-4 against thresholds for the IDR on a P50 basis



Source: Analysis of cash PMICR undertaking using Ofwat financial model, with changes to functionality made to facilitate use of assumptions and approach set out above.

235. Note: PMICR calculated in line with the approach taken by Fitch, presented on the basis of the FD including the delivery mechanism.

236. Figure 5 shows that the notional company would only be able to achieve a BB implied IDR, and therefore a likely BB+ senior unsecured debt rating, consistent with the equivalent rating outcome under Moody's.

237. Given the notional company under the FD fails the first debt financeability test (1) with the median implied rating below investment-grade, it therefore must also fail the second financeability test (2), having no financial resilience against downside risk (**P10**).

238. Under the FD, the notional company would not only be unable to achieve the minimum rating required to have some prospect of achieving the allowed cost of new debt, it would be expected to fall below investment-grade with S&P in any downside scenario and failing to meet the minimum licence requirement of Baa3/BBB-. Were ODIs and other incentives assumed to impact cashflows, and therefore, credit metrics in AMP8, the notional company may be unable to achieve an expected (**P50**) investment-grade rating with S&P.

239. Under that scenario, the notional company would not be able to raise the capital required to deliver our investment programme and better outcomes for customers. Consequently, the FD is not financeable for the notional company, and therefore the FD does not accord with Ofwat's financing duty in respect of debt. The fact that the notional company does not pass the debt financeability assessment indicates that Ofwat's estimate of cost of capital is too low and the level of risk exposure implied by the FD is too high.

7.3. Equity investability

7.3.1. Investor considerations

240. Ofwat's financing duty is not defined only with reference to debt—equity financeability must also be assured for the notional company, including the ability to secure "*reasonable returns*" on equity capital. This is particularly relevant at PR24, where Ofwat itself has recognised, when aiming up on its cost of equity estimate in the FD, that the sector needs to be able to attract substantial new equity capital:

> "*It is important that our determinations are seen to support investment and investor confidence at a time when all companies (whether good or poor performers) are expected to continue to raise record levels of debt and equity finance, while competing with other sectors and internationally for the allocation of that capital.*"

241. Given the scale of our investment programme, the notional company must be able to attract new equity. Even if the notional company were not to pay a dividend yield, a position that itself would challenge equity financeability, that would not be sufficient to meet the AMP8 funding requirement without putting additional pressure on credit metrics and therefore ratings, as demonstrated by Figure 3. In order to assess financeability at PR24, an assessment of equity financeability is critical, it cannot be simply assumed.

242. Investors have many opportunities to deploy capital beyond UK water, including in other comparable sectors inside and outside the UK, and other asset classes such as investment-grade debt, particularly if the equity premium over debt is insufficient in view of the higher risk exposure. Investors will only commit equity to UK water if the risk-adjusted expected return is competitive against comparators and if the total risk exposure is in line with expectations for the regulated utility sector.

243. As well as the total return, dividend yield is an important metric for investors, particularly so where the perception of regulatory risk in the sector is currently higher than for comparators, as research conducted by Barclays suggests.[45]

244. In general, dividend yield can be perceived to 'de-risk' investments, as it reduces reliance on an uncertain future exit value, however investors may take less comfort in the water sector since Ofwat's rules on dividends are highly prescriptive and constraining, unlike in sectors such as energy networks. The FD assumes a 4% nominal dividend yield for the purpose of the debt financeability assessment; however given investors are likely to perceive risk as heavily tilted to the downside, that may not be sufficiently attractive to incentivise the commitment of new equity.

245. Given the perception of increasingly less stable and predictable regulation in the sector, including as assessed by credit rating agencies in their business risk assessments, equity investors are likely to exercise scepticism around the ability to secure reasonable total returns ex ante, and consequently require a premium to returns on offer for comparable investments in other sectors to account for perceived regulatory risk in the UK water sector.

246. There are also significant 'clientele effects' in the infrastructure investment market, particularly for regulated utilities – some investors are unable to accept higher risk exposure, regardless of return, due to the underlying requirements of certain pools of capital, including target risk characteristics. An assessment of equity financeability must therefore consider the magnitude of risk exposure.

[45] Barclays, November 2024, UK Water - Rating agencies and investor survey: all about contagion , page 7, SOC-1-0011.

7.3.2. Errors in the FD financeability assessment

247. The assessment of equity financeability in the FD was deficient and contained several specific material errors, including:

a) **Insufficient analysis of equity financeability:** Ofwat undertook very limited analysis of equity financeability in general, relying instead on its assessment of the cost of equity and implicitly assuming that that estimate was appropriate, then the sector would be able to attract the new equity required.

New equity cannot be assumed to be forthcoming without an assessment of equity financeability, particularly without any robust benchmarking of expected equity returns. The very limited benchmarking of dividend yield in the FD was not accompanied by any benchmarking of the total return, nor did Ofwat consider the risks associated with dividends in the UK water sector, where the extent of regulatory intervention undermining expected dividends is far greater than in comparable sectors.

b) **Lack of consideration of expected (P50) performance due to lack of robust risk analysis:** Ofwat did not undertake robust risk analysis as part of the FD and consequently, did not have any credible basis on which to assess the implications of the expected (P50) risk-adjusted return implied by the FD for equity financeability. The assessment of debt financeability in the FD also assumed, erroneously, neutral expected performance for a notional company operating in our region.

Our robust analysis of risk exposure revealed substantial negative expected (P50) performance, and hence that the FD does not represent a 'fair bet', as implicitly assumed by Ofwat.

c) **Lack of analysis of risk exposure on equity financeability:** Given the lack of robust risk analysis in respect of the FD, Ofwat also lacked a credible basis to assess the implications of the risk exposure implied by the FD on equity financeability. The FD did not undertake any benchmarking of risk exposure, either in relative or absolute terms, and consequently it omitted to consider the impact of the magnitude of risk exposure implied by the FD on the notional company's ability to attract new equity, particularly considering 'clientele effects', as described previously.

These errors meant that Ofwat was not able to assess whether the FD was financeable with equity capital, despite the importance of equity for AMP8, as the regulator recognised when estimating the cost of capital.

7.3.3. An appropriate approach to assess equity financeability

248. An assessment of equity financeability for the notional company must necessarily be broad and holistic given the junior, risk-bearing role of equity, where it ultimately underwrites all residual risks borne by the company, but also the requirement for new equity at PR24, beyond what has already been committed. The assessment must consider debt financeability, but adopt a broader approach, considering cross-checks and the competitive wider investment environment, including comparable opportunities elsewhere.

249. In the RIIO-3 Sector Specific Methodology Consultation for E&GT and GD, Ofgem recognised the need to consider equity financeability in the broadest sense, which it referred to as 'investability', in the context of the requirement for new equity to support the energy transition:

"While there may be no explicit in-year cash costs that would threaten equity financeability, investability considers whether the allowed return on equity is sufficient to retain and attract the equity capital that the sector requires. This issue is likely to be increasingly important in the coming years as the need to invest in infrastructure rises significantly (for energy networks across the UK and globally) and companies are required to seek 'fresh' equity from their investors over and above what they would be able to fund via retained earnings."[46]

250. A robust approach to assessing equity financeability, correcting the errors set out above and taking into account broader considerations such as the significant requirement for new capital in water and adjacent sectors, should include the following three quantitative tests:

- The expected (P50) equity return for the notional company should be equal to the allowed cost of equity – in other words the price control should be a 'fair bet' that the notional company can earn its cost of capital on a risk-adjusted basis (the **'fair bet' test**);
- The expected excess equity return over a risk-free benchmark for the notional company should be in line with, or above, market benchmarks for comparable investments, considering the need to remunerate equity risks and attract new equity in a competitive market (the **equity premium test**); and
- Risk exposure for the notional company should be in line with what would typically be considered appropriate for a regulated utility, such that an excessive proportion of the allowed return should not be put at risk (the **risk test**).

251. In respect of the second (2) and third (3) tests, modern portfolio theory sets out that there is an efficient frontier defined by the investment universe based on the maximum return available for a given level of yield, below which a rational risk-neutral investor would not invest. Consequently, an investment must be on or above the efficient frontier to be able to attract capital in a competitive market.

252. In addition to the quantitative tests set out above, a holistic assessment of equity financeability, correcting the errors set out above, should include the following two qualitative tests:

- The regulatory framework should be one where there is a high degree of stability and predictability of regulatory decisions, considering the degree of regulatory discretion exercised – frequent changes to regulatory parameters and very broad regulatory discretion can undermine equity financeability (**the regulatory framework test**); and
- The notional company should not be exposed to significant, open-ended downside risk, including the prospect of being unable to achieve a positive dividend yield across the regulatory period (**the downside risk test**).

7.3.4. Assessment of equity financeability

253. Table 13 below sets out the risk-adjusted equity return for the notional company at 10th, 50th and 90th percentiles on the cost of capital, and risk exposure, under the FD. The returns are presented in real and nominal terms assuming CPIH inflation of 2% for comparability.

[46] Ofgem, December 2023, RIIO-3 Sector Specific Methodology Consultation – Finance Annex, page 47, SOC-1-0017.

Table 13: Risk-adjusted equity return for the notional company implied by the FD by percentile, assuming CPIH of 2%

	P10	P50	P90
Allowed cost of equity (real, wholesale)	4.96%	4.96%	4.96%
Risk (RoRE)	-6.41%	-3.75%	-1.12%
Risk-adjusted equity return (real)	-1.45%	1.21%	3.84%
Risk-adjusted equity return (nominal)	0.53%	3.24%	5.92%

Source: Southern Water calculation.

254. Table 13 above shows that the notional company would be unable to earn the allowed cost of return on an expected (P50) basis. The expected risk-adjusted return would be only c.24% of the real allowed return (c.46% in nominal terms), whilst the P10 risk-adjusted return would be negative in real terms. Consequently, the notional company would fail the first financeability test (1) under the FD because it did not represent a 'fair bet'; in fact it would show an expected loss against Ofwat's allowed cost of capital.

255. The notional company would also fail the third financeability test (3), considering that the entire real equity return is at risk at the 10th percentile (a severe, but plausible scenario).

256. In order to carry out an assessment of equity financeability of the FD under financeability test (2) and under test (3), a comparator dataset based on realised equity returns of 138 listed companies was constructed as follows:

- A screen using Eikon was conducted to identify all listed companies in water and comparable sectors globally;[47]
- To control for country risk premia, a filter was applied to restrict the dataset to those companies listed on an exchange, and with the majority of operations, in a developed market;[48]
- To control for potential small company premia, a filter was applied to restrict the dataset to securities with a market capitalisation greater than £800m;[49] and
- To control for illiquidity, a filter was applied to restrict the dataset to securities with a bid-ask spread of less than 1%.[50]

257. For each comparator, annualised total returns (considering price appreciation and reinvested dividends) were calculated based on daily returns over a 10-year period to 31 December 2024 (assuming 250 trading days), considered to represent a reasonable mid-point investment horizon for an infrastructure investor. For the purpose of the analysis, realised equity returns are considered to be the best proxy for investor expectations of future returns given the significant

[47] 'Water and related utilities', 'electric utilities', 'natural gas utilities', 'multiline utilities', 'airport operators and services' and 'renewable fuels'
[48] Defined in the MSCI Developed Market index as: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, United Kingdom, and the United States
[49] Broadly equivalent to the notional regulatory equity value of the WaSCs and large WoCs as of 31 March 2025
[50] Consistent with the assumption made by CEPA in their report: CEPA, December 2024, PR24 Cost of Equity, SOC-1-0021.

weight placed by investors on historical performance and the absence of robust cross-market estimates of future returns.

258. Excess returns were calculated for each comparator based on the realised equity return and a risk-free rate based on the trailing average daily benchmark yield for the 10 year period for the respective listing country.

259. The P10, P50, and P90 percentiles of total return, excess return for the comparator dataset were calculated and compared to the corresponding excess return for the notional company implied by the FD, informed by risk analysis as set out above (see 4.7 Results of our risk analysis), the nominal cost of equity in the FD and the same risk-free rate as for UK comparators. Risk was assessed on an economic basis, aligned to the basis on which infrastructure equity investors typically consider returns. **Error! Reference source not found.** sets out the excess equity return for the notional company implied by the FD against the comparator set, split by geography and percentile.

Table 14: Excess equity return for the notional company implied by the FD (AMP8 average in nominal terms) against the comparator set, split by geography and percentile

	P10	P50	P90
Notional company (AMP8)	-1.29%	1.43%	4.11%
UK & European comparators	1.73%	4.72%	11.66%
All comparators	-0.76%	4.48%	9.55%

Source: analysis of Refinitiv data following methodology set out above.

260. Table 14 above shows that the expected (P50) equity excess return over a risk-free benchmark for the notional company is materially below market benchmarks for comparable investments, an adverse variance of 3.05% against all comparators and 3.29% against UK and European comparators, the latter particularly relevant given that expected returns will be closely benchmarked by equity investors within that geography in the first instance. Furthermore, the expected excess return for the notional company is also below market benchmarks at both P10 and P90, revealing that irrespective of performance assumptions, the FD does not provide for a competitive risk-adjusted return.

261. The results of this analysis are that the notional company fails the financeability test (2) under the FD.

262. In view of the actions taken by credit rating agencies to downgrade their assessment of the regulatory framework, driven by concerns around stability and predictability and regulatory independence, the FD can be said to fail the qualitative financeability test (4).

263. The notional company is exposed to significant, open-ended downside risk under the FD, demonstrated by the entire real FD equity return being at risk at P10 – in that scenario, the notional company would be unable to pay any dividends in AMP8 given the negative real return. The notional company would be unable even to pay dividends given expected (P50) performance considering the implied rating outcomes as set out previously in relation to debt financeability. Consequently, the FD can be said to fail the qualitative financeability test (5).

264. Overall, when considering the risk exposure implied by the FD and returns in respect of comparable investments elsewhere, the notional company would fail all five equity financeability tests, both quantitative and qualitative, and be unable to attract the capital required in AMP8. The fact that equity is not financeable under the FD further renders debt unfinanceable in view of the

critical risk-bearing role of equity in the capital structure.

7.4. Conclusions

265. There are a number of errors in Ofwat's debt financeability assessment and its equity financeability assessment is inadequate. Correcting for those errors and assessing financeability robustly, on the basis of a robust risk analysis, highlights several critical issues that render the notional company unfinanceable under the FD for both debt and equity.

266. An appropriate debt financeability assessment, correcting for errors made in the FD assessment and using market-based tests, reveals that the notional company is unable to achieve the target credit rating of Baa1/BBB+ and instead is at or below the lowest investment-grade rating, with no financial resilience against downside risk (P10).

267. Equity financeability assessment using appropriate tests informed by market considerations and rational investor behaviour, shows that the risk-adjusted returns implied for the notional company by the FD fails to represent a 'fair bet' to investors. That assessment also indicates that the notional company is uncompetitive against comparators given an excessive proportion of return that is placed at significant risk.

268. In summary, the notional company is not financeable under the FD given the risk exposure and allowed returns set by the FD.

8 Risk specific remedies

269. The FD included two overarching risk mitigation mechanisms: the Outcome Adjustment Mechanism (OAM) and Aggregate Sharing Mechanism (ASM). The OAM aims to address median ODI performance risk; while the ASM aims to limit risk at the extremes for Totex and ODIs.

270. We set out all our proposed remedies across the determination in the relevant Chapters of this SoC. Even if these remedies are applied, e.g. closing cost gaps and recalibrating PCLs, the design of the OAM and ASM protections in the FD was insufficient to provide the protection intended and we therefore propose the following remedies.

8.1. OAM

271. The OAM applies a sector wider adjustment to RoRE outcome across ODIs and Measures of Experience based on out- or underperformance by the median company. It is designed to protect against miscalibration of the ODI package. The mechanism is split by water and wastewater price controls and includes a ±50bps deadband, within which the mechanism does not apply.[51]

8.1.1. Error: The OAM deadband provides insufficient protection and is unlikely to correct for base case penalties.

272. The presence of the deadband exposes the sector to 50bps underperformance risk which could crystallise due to miscalibration in the FD. Through this feature, a significant part of the risk that the mechanism was designed to address will not be mitigated.

273. Sector analysis using AMP7 data suggests that a modest OAM adjustment would have been applied to both Wastewater PCs (+0.36%) and Water PCs (+0.59%). However, without the deadband, the adjustment would have been significantly higher, at +0.98% for Wastewater PCs and +2.11% for Water PCs.

Given that the overall risk generated by the FD is significantly skewed to the downside, it is clear that opportunities granted by mechanisms such as the OAM still require re-calibration in order to provide overall risk protection

8.1.2. Remedy

274. We therefore propose removal of the ±50bps deadband to more completely address base case miscalibration risk and ensure the outcomes package has an expected outcome more closely aligned to 0% RoRE.

8.2. ASM (ODI and totex)

275. The ASMs protect against severe outcomes by applying additional cost sharing once a threshold level of RoRE out- or underperformance is reached. The ODI ASM applies 50% sharing at ±300bps and 90% sharing at ±500bps. The Totex ASM applies 50% sharing at ±200bps with no higher sharing threshold. The ODI ASM applies to water and wastewater price controls separately, while the Totex mechanism applies to total cost risk and does not distinguish between price controls.

[51] While in general, we welcome the application of the OAM, its existence does not replace the proper calibration of PCLs and ODIs, which we address in Chapter 6.

8.2.1 Error 1: Combining water and waste businesses within the totex ASM reduces potential risk mitigation and creates distortions.

276. The lack of separation between price controls by the Totex ASM is likely to limit the ability of the ASM to mitigate risk, particularly in our much smaller water business. Counted together, the effect of an overspend in the water business could be offset by underspending in the wastewater business. This is inconsistent with the application of cost sharing rates, where water and wastewater overspends are treated separately. This inconsistency would add a significant distortion and could act as a perverse incentive to invest in one business because of the regulatory treatment and not because of the needs of the operation.

277. In addition, given the common situation between water operations in WASCs and WoCs, where they are likely to require a similar pattern of investment, given common regulation, a combined water and wastewater Totex ASM would also distort the revenue protections for similar operations between WASCs and WoCs.

8.2.2 Error 2: The ASM thresholds are calibrated to a level that removes potential risk mitigation and financeability protection.

278. The ASM thresholds are exceedingly high and leave scope for potentially 500bps RoRE (c.£182m p.a.) underperformance before offering any protection. This allows for potentially full erosion of the 496bps wholesale allowed return on equity before any protection is offered. No protection is provided up to ±200bps RoRE (c.£73m p.a.) and ±300bps (c.£109m p.a.) for the Totex and ODI outcomes respectively. The FD did not adequately consider the relationship between these thresholds and the financeability assessment. These thresholds are too large to support financeability as they do not offer sufficient protection to robustly maintain at least Baa2/BBB negative outlook ratings required for financeability. See our Financeability assessment in Section 6 Financeability assessment..

279. While it is possible that the ASM thresholds could be triggered, if AMP8 outturns into an extreme overspending scenario, as we have seen in AMP7, the level of risk mitigation required to solve for the overall RoRE risk exposure needs to be greater than catering merely for an extreme scenario.

280. We note that Severn Trent proposed a Totex ASM threshold ±100bps of regulated equity. This was to align with Ofwat's view of P10 and P90 totex outcomes.[52]

8.2.3 Remedies

281. We therefore propose two remedies:

a) Introduce consistency between the ASMs by **separating water and wastewater price controls in the Totex ASM** to align with the ODIs ASM. The ASM would be triggered separately for significant overspending over thresholds in water and wastewater; and

[52] Severn Trent, August 2024, SVE3.01 - Risk and return - Draft Determination representations, page 15, SOC-1-0022.

b) **Amend the thresholds** such that the sum of the thresholds across the Totex and ODI ASM is equivalent to Ofgem's Return Adjustment Mechanism (RAM) application with 50% sharing at ±300bps and 90% sharing at ±400bps. I.e.,
   - Totex ASM: 50% sharing at ±150bp and 90% sharing at ±200bps; and
   - ODI ASM: 50% sharing at ±150bp and 90% sharing at ±200bps.

   To be clear, we propose to keep the Totex and ODI ASMs separate.

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Chapter 2
Base Costs

1. Executive Summary

1. The base cost allowance is set to fund the costs needed to deliver the base level of routine service and to maintain existing assets. This allowance is set through a combination of sector-wide econometric modelling and out-of-model adjustments and Cost Adjustment Claims (CACs) to account for unique company-specific circumstances.

2. Allowances for capital maintenance are included within the overall base cost allowance without any adjustment to account for the actual health of our asset base. This has led to systemic under-funding, meaning we have had to invest £585m above our base allowance of £3.6bn in our wholesale water asset base over the last 20 years to meet our statutory capital maintenance requirements. This is unsustainable.

1.1. Errors

3. The FD provides an inadequate base cost allowance due to several distinct errors. We have concentrated on Ofwat's methodological approach to calculate base costs, and have identified errors across all three aspects of Ofwat's approach in setting the base cost allowance.

4. First, Ofwat has not applied its own modelling principles consistently in its econometric modelling:

- **Error 1: Wastewater econometric modelling:** Ofwat has gone against its modelling principles by including "Load treated in size bands 1 to 3 (%)" as an explanatory variable for economies of scale in the sewage treatment econometric model within the wastewater modelling suite. This is despite this variable failing modelling robustness tests and being weaker from an engineering perspective than the continuous Weighted Average Treatment Size (**WATS**) variable due to its discrete nature. Correcting this error by dropping this explanatory variable and instead relying on more statistically robust models with greater engineering rationale that use the continuous WATS variable, which draws out the differences in unit cost within the discrete size bands (which are significant), increases our allowance by £41m.
- **Error 2: Water econometric modelling:** Ofwat has similarly gone against its modelling principles by including "Average pumping head (APH)" as an explanatory variable in its water models despite the data for this variable not being of good data quality. Correcting this error by dropping this variable and instead relying on models that use the booster pumping variable, which was introduced by Ofwat as an explanatory variable in PR19 it is not affected by data quality issues, increases our allowance by £53m

5. Ofwat has rejected most of our CACs, by applying an acceptance criterion which is heavily skewed towards rejecting claims:

- **Error 3: Rejecting advanced anaerobic digestion CAC:** Ofwat has rejected our CAC to fund the advanced anaerobic digestion (**AAD**) upgrade needed at two sludge treatment centres. Ofwat considers the bioresources base cost allowance to be sufficient to fund these upgrades. This assessment is inconsistent with the precedent that was set in allowing Thames Water a separate allowance for a similar bioresources scheme, and is in any event wrong as it fails to have regard to the fact that other companies' comparable AAD upgrades were funded historically separately from the base allowance. Correcting this error increases our bioresources base cost allowance by £101m.
- **Error 4: Rejecting regional labour cost CAC:** Ofwat has rejected our **regional labour cost CAC**. Our location in the South East of England, particularly close to London, places us

in a region with significantly higher wages than the national average. The role of regional labour costs in driving expenditure is well recognised in the energy sector and we have conducted similar analysis to evidence the additional costs we face. Correcting this error, by including a median wage index as a driver in the econometric model, increases our water and wastewater base cost allowances by £73m and £85m respectively.

- **Error 5: Rejecting our coastal population CAC:** Despite accepting our engineering rationale supporting higher costs for coastal wastewater sites, Ofwat concluded that its own unit cost analysis gave inconclusive results across the sector. It therefore rejected our **coastal population CAC**. There are methodological flaws in Ofwat's assessment and correcting for these shows that the unit cost for coastal sites across the sector is 41% higher than inland sites across the sector. This differential is supportive of the 43% cost differential we identified for our sites over the entire AMP. The bottom-up unit cost analysis is supported by econometric evidence that a coastal variable exerts a perceptible, significant and logical influence on wastewater treatment costs. Correcting this error, by including this coastal population variable in the econometric model, increases our wastewater base cost allowance by £126m.

6. Finally, Ofwat has made errors in the out-of-model adjustments carried out, in addition to not making a necessary adjustment for a critical under-funded area:

- **Error 6: Over-optimistic Frontier shift:** The FD includes a year-on-year efficiency improvement ('**frontier shift**') that Ofwat assumes for the water sector during each AMP. Ofwat assumes a 1% frontier shift, in line with the most efficient high-tech sectors in the UK economy. This is despite the water sector historically not achieving efficiency anywhere near this level. Between 1995 and 2019, only 14 out of 46 sectors in the UK had productivity growth of 1% or more. Adopting a more realistic 0.5% frontier shift would increase our cost allowance by £125m.
- **Error 7: Unrealistic assumptions around power cost share and forecast energy prices:** Ofwat made an out-of-model adjustment to account for the recent energy price increases and future uncertainty around the future price. Ofwat models each company's power costs based on the most recent five years. This contrasts with how Ofwat normally uses the entire modelling period of 13 years (i.e. from 2011/12) to account for the cyclical nature of this cost. In comparison to the rest of the sector that experienced higher recent energy costs, we are uniquely negatively impacted by this assumption due to our favourable recent hedging position. Ofwat also sets an unrealistic glide path for future energy prices, beyond the reduction assumed by Government forecasts. This creates immediate cashflow risks for us and unnecessary bill shocks for customers. Correcting for these issues, by modelling costs over a longer period and using a more justifiable glide path, increases our allowance by £47m.
- **Error 8: Lack of urgency around asset health under-funding:** Ofwat has recognised the difficulty of assessing capital maintenance requirements going forward. However, despite the clear recommendation at the CMA PR19 Redetermination, Ofwat has not enhanced its approach to capital maintenance with a forward-looking element. According to our analysis, we have been under-funded by £585m across the wholesale water asset base from 2005 to 2025. Ofwat is only now seeking to better understand the sector's asset health position to enable it to potentially make further sector-wide adjustments at a later point. This approach lacks definition, clarity and urgency, whereas the evidence strongly points to systematic under-funding across multiple AMPs and a need for additional funding in AMP8. We require a gated allowance of up to £500m that can be accessed when evidence of specific asset health requirements is presented.

1.2. Impacts

7. Each of the errors we identify individually represents a significant shortfall in funding for essential areas of our work. Together the under-funding represents a substantial gap which cannot be accommodated within the framework of the price control:

Table 1: Impacts from FD errors related to base costs

Error	Impact (£m, 2022/23)
Error 1: Wastewater econometric modelling	£41m
Error 2: Water econometric modelling	£53m
Error 3: Rejecting advanced anaerobic digestion CAC	£101m
Error 4: Rejecting regional labour cost CAC	£158m
Error 5: Rejecting our coastal population CAC	£126m
Error 6: Over-optimistic Frontier shift	£125m
Error 7: Unrealistic assumptions around power cost share and forecast energy prices	£47m
Error 8: Lack of urgency around asset health under-funding	Gated Allowance

Note: The remedy for Error 6 includes a £66m increase related to base costs and £59m related to enhancement costs

1.3. Remedies

8. We ask the CMA to consider the analysis presented against each of the FD's analytical approaches taken to assess base costs, and to grant the additional allowances sought by Southern Water we are requesting in the case of errors 1 to 7.

9. As regards error 8, we require immediate action on asset health through a gated allowance that can be accessed as evidence of specific asset issues is presented.

2. Modelling

Ofwat uses modelling to determine the efficient level of cost for each water company

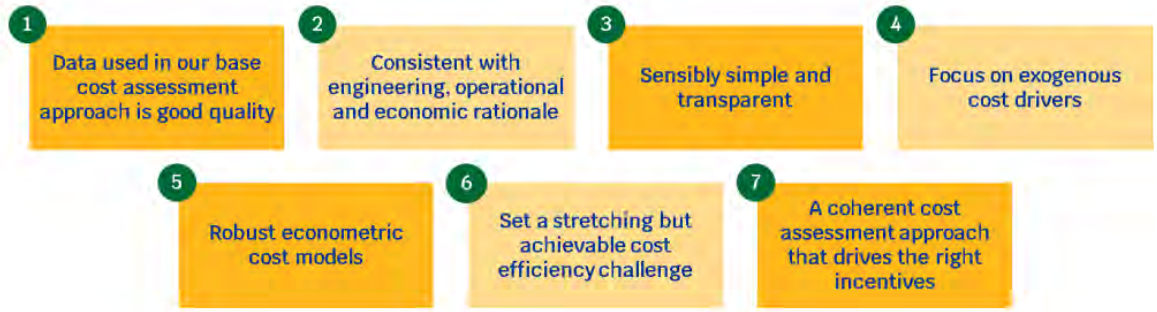
10. Base costs are the routine costs which companies incur to provide a base level of service to customers and maintain the long-term capability of assets. In assessing the level of funding that customers should provide for these costs, Ofwat has developed a modelling suite to determine what it considers to be the efficient level of expenditure. Most of these costs (86%) are assessed through econometric benchmarking.[1] The base cost models use historical data, from 2011/12 up until 2023/24, to determine base cost allowance for each company.[2]

11. These econometric models have been iterated through multiple price review cycles. Ofwat has made amendments to the models since PR19, including adding several new variables and an updated suite of models. However, as Ofwat has noted at FD, its intention was to build on the PR19 base cost models, with a high bar required to make changes from the PR19 base cost models.[3]

12. In PR24, Ofwat determined an efficient level of costs separately for each of the wholesale water, wastewater network plus and bioresources price controls.[4] Ofwat used random effects to account for variability in the modelling that is not explained by the observed variables. It estimated the base cost econometric models, utilising a panel data set encompassing historical data from all water companies from 2011-12 onwards. A range of models was used for each price control, and Ofwat triangulated them to determine the final modelled allowance.[5]

13. The principles of Ofwat's PR24 base cost assessment are summarised in Figure 1 below:

Figure 1: Ofwat's principles of PR24 base cost assessment[6]



Note: Ofwat criteria for making changes in PR24 from PR19 base cost models

[1] Southern Water, March 2025 – Analysis of Ofwat's PR24 FD CA02 Base costs aggregator model - This is the percentage of the total base allowance that comes from the modelled costs pre-frontier shift and RPEs
[2] Ofwat, December 2024, PR24 FD: Expenditure allowances – base cost modelling decision appendix, FD pages 13-14, SOC-2-0001.
[3] Ofwat, December 2024, PR24 FD: Expenditure allowances – base cost modelling decision appendix, FD page 15, SOC-2-0001.
[4] This Chapter focusses on the wholesale base costs. Ofwat also set a price control for residential retail.
[5] Ofwat, December 2024, PR24 FD: Expenditure allowances – base cost modelling decision appendix, page 14, SOC-2-0001.
[6] Ofwat, December 2024, PR24 FD: Expenditure allowances – base cost modelling decision appendix, page 15, SOC-2-0001.

14. Ofwat challenged the allowances requested in our Business Plan on the basis of the results from its modelling process and its review of adjustments to the model that we proposed. This has led to a base cost gap of £328m (after allowing for Ofwat's reallocation of assessed costs) between what was requested in our DD Response[7] to deliver the base level of service to customers and what has been allowed in the FD.

15. Table 2 below shows our funding gap in the FD by price control.

Table 2: Gap between our DD Response base cost request and FD by Price Control (£m, 2022/23 prices)[8]

Price control	Amount assessed requested (£m) – *post-frontier shift and RPEs*	Final Determination (£m) – *post frontier shift and RPEs*	Gap (£m)	Gap %)
Wholesale water	1,433	1,262	-171	-12%
Wastewater network plus	2,216	2,100	-116	-5%
Bioresources	243	272	29	12%
Residential Retail	426	356	-70	-16%
Total	**4,319**	**3,991**	**-328**	**-8%**

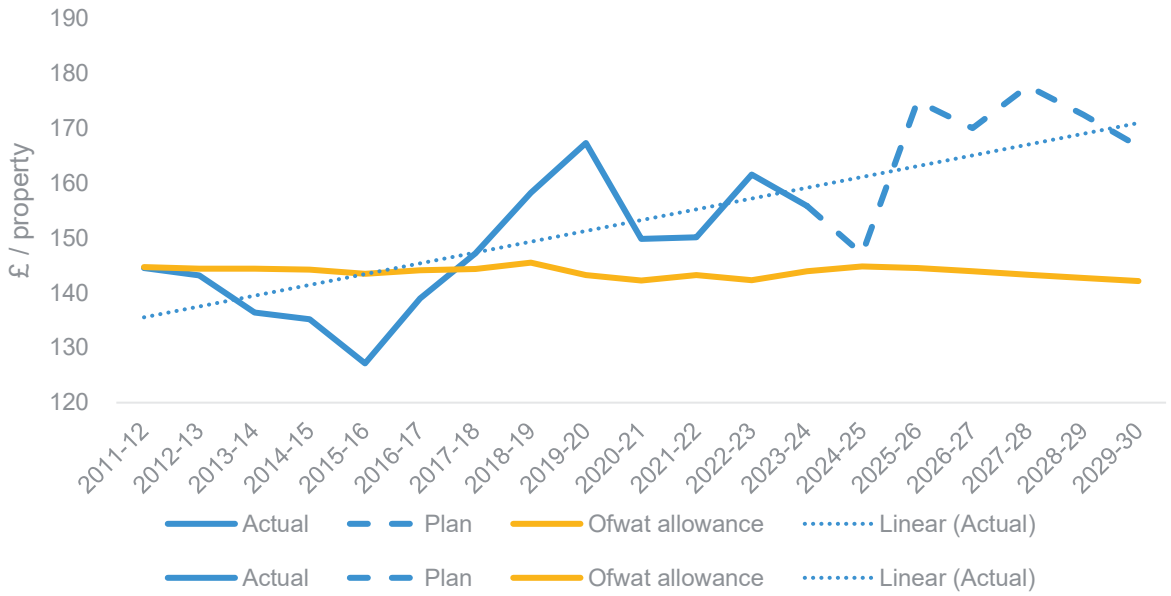
Note: Base cost FD allowance is £328m (8%) lower than what was requested in our DD Response

16. Stepping back, an important cross check of Ofwat's modelling is whether in aggregate the industry notional company would be sufficiently funded (before any atypical adjustments). This is illustrated by looking at the median unit cost allowance vs industry unit costs.

17. If Ofwat's modelling were delivering sufficient funding, we should expect to see industry median unit costs tracking allowances very closely with variances above or below attributable to company efficiency differences. This is simply not the case for the wholesale water model as illustrated in Figure 2 below, even before catch-up and frontier efficiencies are applied.

[7] Southern Water, August 2024, Our response to Ofwat's draft determination on our Business Plan for 2025–30, SOC-2-0002.
[8] For completeness, we have included the gap for the residential retail price control.

Figure 2: Wholesale water median modelled allowance per property vs industry median cost per property



Source: Southern analysis of Ofwat FD Water Models[9]

18. This chart shows that there is a clear time trend of industry median unit costs increasing over time. This is driven by an increasing tightening of water quality standards, enhanced monitoring requirements and an increasing marginal cost of water arising from environmental requirements from water body protections. The PR24 water models do not capture this effect, leaving companies increasingly under-funded. Had the models been used historically they would have underfunded the industry in every year since 2017/18.

Errors in Ofwat's econometric modelling mean our allowances will be insufficient to fund the activities we are required to deliver

19. Ofwat has made several errors when setting its base allowances in the FD which contribute towards this overall base cost gap.

20. When developing econometric models, Ofwat should always use the best available data. It should pick variables to improve the robustness and significance of the models. These ensure the models are fit for purpose and best capture the costs companies incur in running their business.

21. In our DD Response, we proposed a few specific amendments to the variables included in the base cost models which have not been accepted by Ofwat. In the FD, Ofwat has explained why it chose not to account for our proposals. We disagree with Ofwat's reasoning for the reasons set out below. Ofwat has made errors in not adjusting its modelling suite in response to our proposal. We set out details of these errors below and adjustments that are required.

[9] Southern Water, Error 8 - Asset health, worksheet "Median cost per property", SOC-2-0073

2.1.1. Error 1: Wastewater econometric modelling: Inclusion of "Load treated in size bands 1 to 3 (%)" as an explanatory variable for economies of scale in the sewage treatment econometric model within the wholesale wastewater modelling suite

The issue

22. One of the drivers in Ofwat's wastewater models is economies of scale at wastewater treatment works. There are economies of scale in wastewater treatment works as larger treatment works are expected to have a lower unit cost of treatment than small treatment works. The size of wastewater treatment works is outside of company control as it depends on the needs of customers in a given area, which cannot be controlled. Companies serving sparsely populated areas tend to have smaller wastewater treatment works.[10] Therefore, it is important that this factor is captured in the wastewater models.

23. In PR19, Ofwat used two explanatory variables to account for economies of scale within wastewater treatment works.[11] These were both "discrete" variables, each setting out the percentage of the wastewater load that is treated in specific bands:

- **Bands 1-3** - the proportion of load treated at small works in bands 1-3 (i.e. works that treat wastewater in areas with ≤ 2,000 population), which took into account any diseconomies of scale from operating small works (the **discrete Band 1-3 variable**); and
- **Band 6** - the proportion of load treated at the largest category of works in band 6 and above (≥ 25,000 population), to capture economies of scale at large treatment works (the **discrete Band 6 variable**).

24. For PR24, Ofwat triangulated econometric models with two different drivers of economies of scale: (a) a discrete variable, load treated in size bands 1 to 3 (%) (i.e. the discrete Band 1-3 variable), and (b) a continuous variable, weighted average treatment size (**WATS**) (the **WATS variable**).[12]

25. Table 3 summarises the explanatory variables included in PR19 and PR24 sewage treatment and wastewater network plus base cost models.

[10] Ofwat, December 2024, PR24 FD: Expenditure allowances – base cost modelling decision appendix, page 33., SOC-2-0001.
[11] Ofwat, December 2019, PR19 FD: Securing cost efficiency technical appendix, page 172, SOC-2-0008.
[12] Ofwat, December 2024, PR24 FD: Expenditure allowances – base cost modelling decision appendix, page 33, SOC-2-0001.

Table 3: Explanatory variables used in sewage treatment and network plus models in PR19 and PR24

	PR19	PR24
Sewage treatment	**2 models** Load (in 2 models). Load treated with ammonia permit ≤ 3mg/l (in 2 models). Load treated in size bands 1 to 3 (%) (the discrete Band 1-3 variable) (in 1 model) Load treated in size band 6 (%) (the discrete Band 6 variable) (in 1 model)	**2 models** Load (in 2 models). Load treated with ammonia permit ≤ 3mg/l (in 2 models). Load treated in size bands 1 to 3 (%) (the discrete Band 1-3 variable) (in 1 model) Weighted average treatment size (the WATS variable) (in 1 model)
Wastewater network plus	N/A	**2 models** Load (in 2 models) Pumping capacity per sewer length (in 2 models). Load treated with ammonia permit ≤ 3mg/l (in 2 models). Load treated in size bands 1 to 3 (%) (the discrete Band 1-3 variable) (in 1 models) Load treated in STWs ≥ 100,000 people (%) (in 2 model) Weighted average treatment size (the WATS variable) (in 1 model) Urban MSOA rainfall per sewer length (in 2 models)

Note: Explanatory variables in the table which are not in use in PR24 are highlighted in red. Explanatory variables in the table which have been introduced in PR24 are highlighted in green.

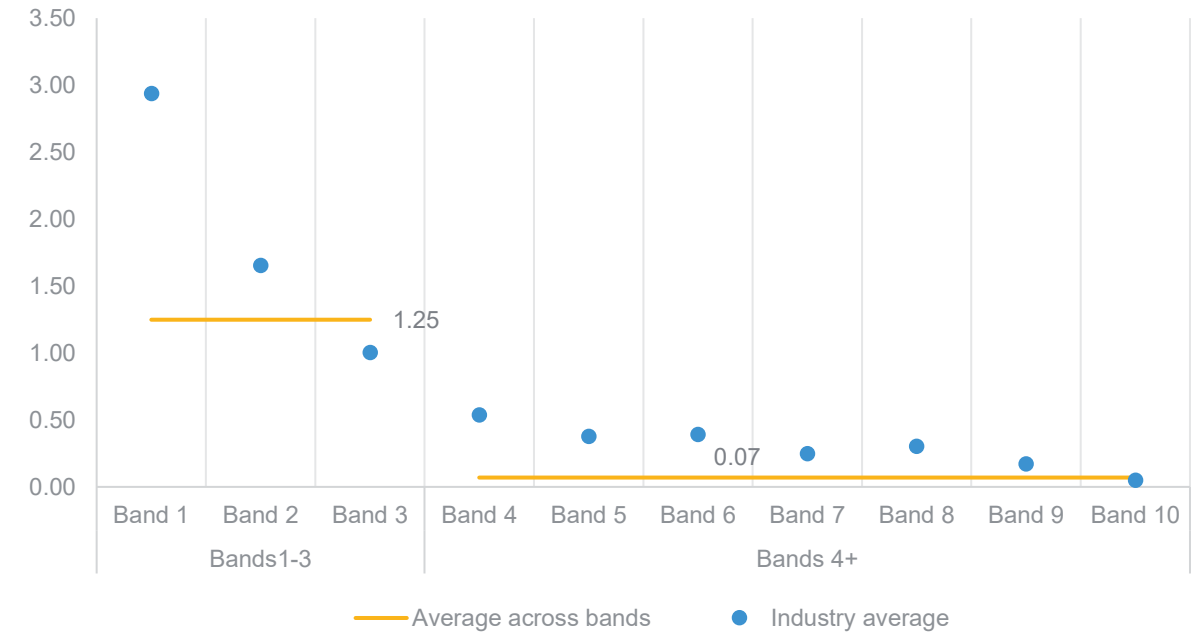
26. Ofwat's PR24 decision to use a continuous variable in one of its models for PR24 is an improvement compared to PR19. Where discrete variables are used, this can result in data points that are meaningfully different being grouped together and treated as though they were the same. This means they cannot reflect the full detail of the available data, and therefore their usefulness is limited.

27. Figure 3 and Figure 4 show that there is a wide variation in the unit cost both between bands and within bands 1-3.[13] Despite the range of unit costs, the same average unit cost allowance (shown by the orange line on charts) would apply to all works. So, for example, a company with smaller works sizes that incurs a relatively high unit cost would only get compensated as though its unit costs were in fact much lower. This is a real impact for us as (and other companies) that do not have any works in the largest band sizes. We will only get compensated for a lower average unit cost rather than the actual unit costs of our sites. This demonstrates that the discrete variable will only capture part of the unit cost differential that exists across the continuous range.

28. Even small differences on wastewater treatment work sizes between companies can have a material impact on treatment costs. Companies like ours with treatment work sizes that are at the lower end of a large band are disadvantaged by being grouped together with larger sites. This is an inherent weakness with using discrete variables, which by their nature cannot account for these cost differentials within the very broad categories. In contrast, a continuous variable can show the full range of values.

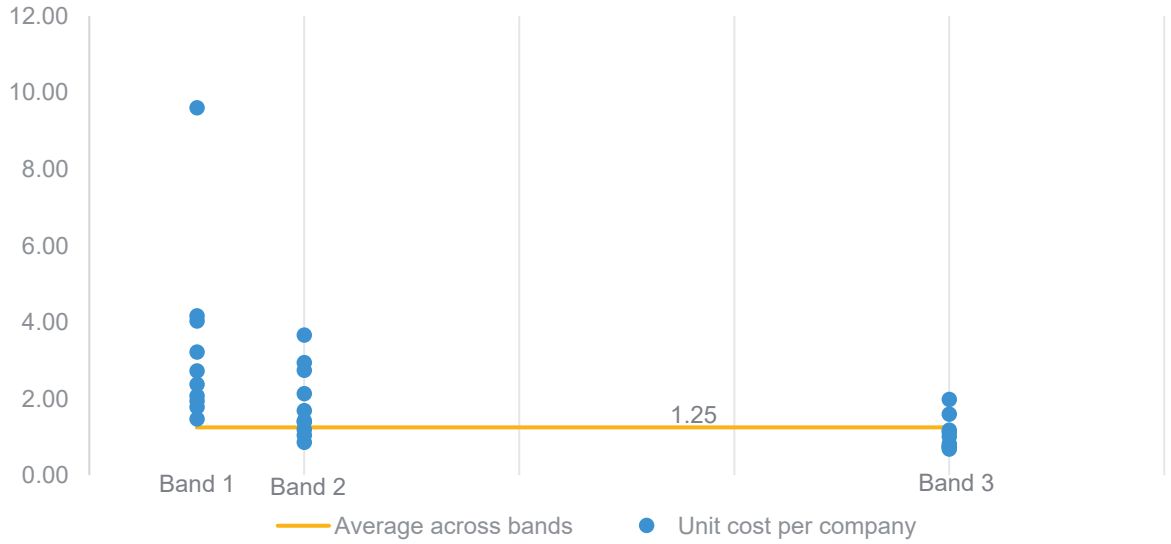
[13] A similar variation can be seen within larger bands as well. However, it is difficult to demonstrate this variation on a single chart across all bands given the number of data points for bigger bands where each site is recorded separately in APR submissions

Figure 3: Variation in unit costs across different band categories (£m/kg, 2023/24)



Source: Southern Water analysis based on 2023/24 APR submissions[14]

Figure 4: Variation in unit costs between companies across bands 1-3 (£m/kg, 2023/24)



Source: Southern Water analysis based on 2023/24 APR submissions[15]

[14] Southern Water, Error 1 - WATS & Load 1 to 3 - Southern Water analysis, worksheet "Charts", SOC-2-0067.
[15] Southern Water, Error 1 - WATS & Load 1 to 3 - Southern Water analysis, worksheet "Charts", SOC-2-0067.

Note: Allocation of works to bands is based on the size of the works based on the population equivalent measure. These graphs demonstrate that wastewater treatment works unit costs vary significantly between bands, these bands categorise the size of works

29. As part of the model development in PR24, Ofwat and its advisors CEPA found that the two original PR19 discrete variables were not statistically significant when calculated based on PR24 data. CEPA concluded that *"We find that the economies of scale drivers in the PR19 SWT model specifications have lost statistical significance… For these reasons, we believe Ofwat should consider alternative economies of scale drivers for the sewage treatment models at PR24, where supported by economic and technical rationale".*[16]

30. Due to these limitations, for PR24 Ofwat introduced the new WATS variable to explain these economies of scale. The WATS variable uses information on the distribution of all WTW sizes rather than focusing on specific size categories. As Ofwat explained in the DD *"This can help explain the overall economies of scale at sewage treatment the company faces more accurately. WATS allows for a more continuous relationship with sewage treatment costs."*[17] The greater granularity arising from the continuous nature of the WATS variable therefore allows the variation within wide bands seen in Figure 3 and Figure 4 above to be captured. This is superior to the alternative discrete variables which can instead only model step-like changes in sewage treatment costs. The WATS variable has strong economic and engineering justification and unsurprisingly performs better than the discrete variables which only tell a partial story.

31. As part of the PR24 consultative process, Ofwat dropped the discrete variable to capture economies of scale at large treatment works (dropping both the original PR19 discrete Band 6 variable[18] and an alternative new variable based on a threshold of 100,000 people[19]). These were both excluded given the inferior properties and performance of discrete variables when compared to the continuous WATS variable, and the limited company support for their inclusion.[20] We support the decision to drop the discrete Band 6 variable, noting that this is consistent with the model robustness tests that Ofwat use to assess its models.

32. Ofwat has, however, maintained the use of the other discrete variable from PR19, i.e. the discrete Band 1-3 variable, as an explanatory variable in both the Sewage Treatment and Wastewater Network Plus models alongside the WATS variable.[21] It has decided to do so notwithstanding that the rationale for dropping the discrete Band 6 variable is equally applicable to the discrete Band 1-3 variable. Within the sewage treatment models, the discrete Band 1-3 variable has inferior properties and performance when compared to the continuous WATS variable. There is also limited company support for the discrete Band 1-3 variable.[22] Based on the criteria Ofwat set out for determining which models to use,[23] and the clear precedent set by removing the discrete Band 6 variable, models using the discrete Band 1-3 variable should have been similarly rejected.

33. Moreover, Ofwat's PR24 triangulation approach (by which it typically seeks to triangulate across a set of models with different cost drivers and levels of cost aggregation to mitigate the risk of error

[16] CEPA, April 2023, PR24 Wholesale Base Cost Modelling, page 83-84 SOC-2-0003.
[17] Ofwat, July 2024, PR24 DD: Expenditure allowances – Base cost modelling decision appendix, page 35, SOC-2-0004.
[18] Ofwat, April 2023, Econometric base cost models for PR24, page38-39, SOC-2-0005.
[19] Ofwat, July 2024, PR24 DD: Expenditure allowances – Base cost modelling decision appendix, page 35 SOC-2-0004.
[20] Ofwat, July 2024, PR24 DD: Expenditure allowances – Base cost modelling decision appendix, page 35 SOC-2-0004.
[21] Ofwat, April 2023, Econometric base cost models for PR24, page 38 SOC-2-0005.
[22] Ofwat, December 2024, PR24 FD: Expenditure allowances – base cost modelling decision appendix, page 33, SOC-2-0001.
[23] Ofwat, April 2023, Econometric base cost models for PR24, page 71 SOC-2-0005.

and bias in any one model) is not a robust method here to assess efficient costs. The WATS variable is a better explanatory variable than the discrete Band 1-3 variable, from both the engineering and econometric perspectives. The triangulation approach therefore reduces usefulness, rather than improving it, as it effectively amounts to triangulating the results from the WATS variable with an inferior version of itself.

Summary of previous representations

34. In our response to both Ofwat's April 2023 base cost modelling consultation and our DD Response in July 2024, we argued against Ofwat retaining the discrete Band 1-3 variable. Anglian Water,[24] United Utilities[25] and Yorkshire Water[26] made similar representations to Ofwat.[27] Despite these representations, Ofwat retained the discrete Band 1-3 variable alongside the WATS variable, arguing that it helped it maintain a triangulated approach to its modelling.

Ofwat's modelling robustness tests demonstrate that the discrete Band 1-3 variable is not fit for inclusion

35. In its consultation on Econometric base cost models at the start of PR24, Ofwat set out the range of model robustness tests it used to assess models. Ofwat rightly points out that a model *"may not pass all model robustness tests"* and *"Statistical robustness tests can provide useful guidance as we develop models, but they should not alone drive our model selection".*[28.] However, in the detailed appendix, which is replicated in the FD, Ofwat assigns a relative importance to each test. For those marked as high importance, Ofwat clarifies that *"failure of these tests and criteria would raise serious concerns about using the model".*[29]

36. One of the high importance tests is the statistical significance of individual parameters, measured by the p value. Table 4 sets out the results of this test for the Ofwat Wastewater models used in the FD

[24] Anglian Water, May 2023, Response to consultation on base cost modelling for PR24, page 1 SOC-2-0006.
[25] United Utilities, April 2023, UUW response - Consultation on econometric base cost models for PR24, page 16, SOC-2-0007.
[26] Yorkshire Water, Draft Determination Representation Expenditure allowances: Part 1: Introduction and base expenditure allowances, page 13, SOC-2-0074.
[27]Ofwat, December 2024, PR24 FD: Expenditure allowances – base cost modelling decision appendix, page 33, SOC-2-0001.
[28] Ofwat, April 2023, Econometric base cost models for PR24, page 16 SOC-2-0005.
[29] Ofwat, April 2023, Econometric base cost models for PR24, page 71, SOC-2-0005 and Ofwat, December 2024, PR24 FD: Expenditure allowances – base cost modelling decision appendix, page 61, SOC-2-0001.

Table 4: Econometric results for the Sewage Treatment and Wastewater Network Plus models

	SWT1	SWT2	WWNP1	WWNP2
Pumping capacity per sewer length (log)			0.405***	0.322***
			{0.000}	{0.003}
Urban rainfall per sewer length (log)			0.138***	0.140***
			{0.000}	{0.000}
Load (log)	0.706***	0.815***	0.748***	0.725***
	{0.000}	{0.000}	{0.000}	{0.000}
Load treated in size bands 1 to 3 (%)	0.025		0.022**	
	{0.293}		{0.048}	
Load treated with ammonia consent ≤ 3mg/l	0.006***	0.006***	0.005***	0.006***
	{0.000}	{0.000}	{0.000}	{0.000}
Weighted average treatment size (log) (WATS)		-0.232***		-0.086*
		{0.000}		{0.061}
Constant	-4.211***	-3.268***	-3.794***	-2.567***
	{0.001}	{0.000}	{0.000}	{0.000}
Observations	130	130	130	130
Adjusted R-squared	0.839	0.891	0.943	0.947
RESET test	0.211	0.786	0.001	0.03
Efficiency range	0.9273	0.5301	0.3329	0.2810

Note: Figures in table show the relationship between each variable and cost.
Figures in braces denote specific p values. Lower p values and more stars denote higher confidence in the relationship noted for that variable. ** = p < 0.05 (95% confidence). *** = p < 0.01 (99% confidence).
Note outlier of *'Load treated in size bands 1 to 3 (%)'* (i.e. the discrete Band 1-3 variable) with a statistically insignificant p value of 0.293.
Models SWT1 and WWNP1 include the Bands 1-3 variable. Models SWT2 and WWNP2 include instead the WATS variable.

37. In model SWT1, at the Sewage Treatment level of cost aggregation, *'Load treated in size bands 1 to 3 (%)'* (i.e. the discrete Band 1-3 variable) has a p value of 0.293 which means statistically a significant effect cannot be detected and there is less confidence in the value of the estimated coefficient. This level of p value raises serious concerns with using this model. Across the entire base cost modelling suite, no model has been included with a parameter with such a high p value and this model stands as an outlier.

38. Ofwat rightly dropped the inclusion of a discrete Band 6 variable[30] due to its inferior properties and performance when compared to the continuous WATS variable. The highest p value for the models

[30] Either defined as band 6 or 100,000 people

including the proposed modified version of the discrete variable to capture economies of scale at large treatment works (i.e. for a band of WTWs serving more than 100,000 people) was 0.20[31]. This implies there is more confidence in the estimated coefficient for the variable that has been excluded than there is in the discrete Band 1-3 variable that has been retained.

39. Further evidence in favour of dropping the discrete Band 1-3 variable is provided by Ofwat's other model robustness tests. On these tests, the sewage treatment model using the discrete Band 1-3 variable (SWT1) performs worse than the model that uses the WATS variable (SWT2).

a) The R-squared measure for a model measures the proportion of variation in costs that is explained by the model. The SWT1 model has a lower adjusted R-squared measure than the SWT2 model (0.839 compared to 0.891) implying that the SWT1 model is a worse fit for the data.

b) The model has a much larger efficiency range[32] (0.9273 compared to 0.5301). Ofwat note that a large range of efficiency scores could indicate the presence of issues in the underlying model, such as the presence of omitted variables.[33]

40. These tests clearly support the (equally clear) evidence of the "statistical significance of individual parameters" test that models based on a continuous WATS variable are superior to those based on a discrete Band 1-3 variable. These econometric results are also consistent with the intuitively logical view that a variable that is able to take account of more granular variations will be superior to one that is limited to specific values within which real-world data must be made to fit. Whilst it might be that none of these robustness tests would in themselves be grounds to dismiss the model in the absence of a better alternative, they collectively confirm the view that the better approach would be to drop models using the discrete Band 1-3 variable altogether in favour of models using the WATS variable.

41. Four companies[34] including us put in representations in response to the DD disagreeing with the continued use of the discrete Band 1-3 variable. The same companies made similar representations in response to Ofwat's base model consultation. Ofwat has not indicated that any companies put in representations in response to the DD in support of continuing to use the discrete Band 1-3 variable.

Triangulation is not a valid basis for inclusion

42. Ofwat's reasoning for continuing to use the discrete Band 1-3 variable was to *"maintain a triangulated approach*". Ofwat typically seeks to triangulate across a set of models with different cost drivers and levels of cost aggregation to mitigate the risk of error and bias in any one model.[35] However, even if there is methodological benefit in triangulating across models in some instances, namely where there is equal uncertainty around multiple models, this is patently not appropriate in this case where the WATS variable is clearly superior to the discrete Band 1-3 variable. The discrete Band 1-3 variable is intuitively less appropriate than the WATS variable and is statistically insignificant. Actively including a weak, insignificant variable into the modelling suite serves only to introduce risk into the overall modelling results, as opposed to mitigating against risk. The

[31] Ofwat, April 2023, Econometric base cost models for PR24, page 86, SOC-2-0005.
[32] Efficiency scores are the ratio between a company's outturn costs and predicted modelled costs in the last 5 years of the sample.
[33] Ofwat, July 2024, PR24 DD: Expenditure allowances – Base cost modelling decision appendix, page 61 SOC-2-0004.
[34] Ofwat, December 2024, PR24 FD: Expenditure allowances – base cost modelling decision appendix, page 33, SOC-2-0001.
[35] Ofwat, December 2024, PR24 FD: Expenditure allowances – base cost modelling decision appendix, page 12, SOC-2-0001.

triangulated results of a strong model and a weak model are less robust than just including an individual strong model.

43. Ofwat does not always triangulate, despite it stating in PR24 that it wants to maintain this approach. For example, in PR19, Ofwat did not triangulate models at all for treated water distribution, despite setting out the same statements concerning the benefits of triangulation, i.e.: *"We combine information from the different levels of aggregation to form our view of efficient costs. We triangulate across multiple models to ensure we do not rely on any one model but on a suite of models. We place equal weights on all models at each level of aggregation."*[36]

44. The CMA considered this as part of the CMA PR19 Redetermination and tested alternative treated water distribution models. It did not find any model that would perform well enough to justify inclusion in a triangulated approach and therefore decided not to triangulate with any other model.[37] Thus, there is clear precedent for not triangulating if the model performance of alternative models does not support their inclusion.

45. For completeness, we would not object to Ofwat choosing to triangulate at the Wastewater network plus level of cost aggregation because, whilst the WATS variable is also intuitively superior in that context, the discrete Band 1-3 variable does not fail the econometric model robustness tests in the same way.

Ofwat's error has given rise to a material shortfall in our base cost allowance

46. Ofwat clearly erred in including a Sewage Treatment model SWT1, which uses the discrete Bands 1-3 variable, as part of the modelling suite. This explanatory variable fails the statistical significance test, measured by the p-value and has a worse R-squared measure and efficiency range than the SWT2 model using the WATS variable.

47. To assess the materiality of this error, we have conducted our own modelling which corrects this error and removes model SWT1 from the models that are triangulated to determine the wastewater allowance.[38] Re-running the econometric models and correcting for this error leads to a £41m increase in our wholesale wastewater base cost allowance.

Required Remedy

48. It is important that only strong, robust models are included in the PR24 modelling suite. Only models that pass the model robustness test should be included. This ensures that the models will most effectively determine the efficient level of expenditure for each company. This in turn will provide confidence that all companies can fund the base costs needed to deliver a strong level of customer service.

49. To remedy the error identified, only one model is required at the Sewage Treatment level of cost aggregation. This model should contain the following explanatory variables:

[36] Ofwat, December 2019, PR19 FD: Securing cost efficiency technical appendix, page 16, SOC-2-0008.
[37] CMA, March 2021, Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations, page 200, para 4.345, SOC-2-0009.

[38] Southern Water, Error 1 - WATS & Load 1 to 3 - Southern Water analysis, worksheet "Remedy allowances exc. Discrete", SOC-2-0067.

- **Load** – as an explanatory driver to explain scale
- **Load treated with ammonia permit ≤ 3mg/l –** as an explanatory driver to explain treatment complexity
- **Weighted average treatment size (WATS)** – as an explanatory variable to explain economies of scale in sewage treatment

50. No changes need to be made to Ofwat's modelling suite at the Wastewater network plus level of cost aggregation.

51. The efficient level of expenditure for each company is determined by re-running Ofwat's FD Sewage Treatment model with these corrected variables and triangulating the results with the other wastewater models. With this error corrected, Southern Water's wholesale wastewater base cost allowance increases by £41 million.

52. We request that the CMA amend Ofwat's modelling suite as described above and therefore that our base cost allowance is increased accordingly..

2.1.2. Error 2: Water Econometric Modelling: Inclusion of Average pumping head (APH) as a network topography explanatory variable in wholesale water econometric models

The issue

53. Ofwat has recognised that Network topography can influence a company's treated water distribution costs through greater requirements to pump and transport water to customers.[39] For PR24, Ofwat triangulated between two variables within its wholesale water models to explain network topography. For PR24, Ofwat retained the "Booster pumping stations per length of mains" variable included in PR19 and also included a new "Average pumping head" (APH) variable.[40] See Table 5 below for details of the full set of explanatory variables included in the wholesale water models.

Table 5: Explanatory variables used in treated water distribution and wholesale water models in PR19 and PR24

Wholesale water models		
	PR19 final determination	**PR24 Final Determination**
Treated water distribution models	**1 model** Length of mains Booster pumping stations per length of mains Weighted average density Weighted average density (quadratic term)	**6 models** Length of mains (in 6 models). Booster pumping stations per length of mains (in 3 models). Average pumping head (in 3 models). Weighted average density – LAD from MSOA + quadratic term (in 2 models) Weighted average density – MSOA + quadratic term (in 2 models)

[39] Ofwat, December 2019, PR19 FD: Securing cost efficiency technical appendix, page 22, SOC-2-0008.
[40] Ofwat, December 2019, PR19 FD: Securing cost efficiency technical appendix, page 22, SOC-2-0008.

		Properties per length of mains + quadratic term (in 2 models)
Wholesale water models	**2 models** Number of properties (in 2 models) Proportion of water treated at complexity levels from 3 to 6 (in 1 model). Weighted average treatment complexity (in 1 model). Booster pumping stations per length of mains (in 2 models) Weighted average density (quadratic term) (in 2 models)	**12 models** Number of properties (in 12 models) Proportion of water treated at complexity levels from 3 to 6 (in 6 models). Weighted average treatment complexity (in 6 models). Booster pumping stations per length of mains (in 6 models). Average pumping head (in 6 models). Weighted average density – LAD from MSOA + quadratic term (in 4 models) Weighted average density – MSOA + quadratic term (in 4 models). Properties per length of mains + quadratic term (in 4 models)

Note: Explanatory variables in the table which have been introduced in PR24 are highlighted in green.

54. APH is a calculation of the amount of work a company does to pump water (volumes and lifts) to meet its operations. It was a variable used within the modelling suite in PR14 to explain network topology. There are concerns over the consistency and quality of APH data provided by companies to Ofwat. These concerns were a factor in Ofwat deciding to exclude the APH variable from its models for the 2019 Price Review[41] (reversing its modelling position from PR14) and the CMA agreeing with this decision.[42] A new variable was instead introduced in PR19 by Ofwat to explain network topology, the "Booster pumping stations per length of mains" variable.

55. In PR24, Ofwat proposed to triangulate between both of these variables.[43] As part of our response to the Base Cost consultation and our DD Response, we argued that the APH variable should be removed as concerns around the data quality still remain. This position was shared by a number of companies, although others argued for it to be included. At the FD, Ofwat maintained its decision to triangulate between the two variables, on the basis that it considered this would balance the pros and cons of each measure, and reflected the mixed feedback received from companies.

Ofwat has not complied with its own modelling guidance

56. Ofwat explained that there needed to be a high bar for making changes to the PR19 base cost models.[44] Ofwat also set out clearly throughout the process the principles supporting its base cost assessment at PR24.[45] Given the high bar for making changes from the PR19 base cost models, it may be inferred that for any such changes to be adopted they would need to clearly adhere to the principles set out by Ofwat in respect of the base cost assessment for PR24.

[41] Ofwat, November 2020, Reference of the PR19 FD: Costs and outcomes – response to provisional findings responses, page 75, A4.3, SOC-2-0011.
[42] CMA, March 2021, Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations, page 141, para 4.83, SOC-2-0009.
[43] Ofwat, December 2019, PR19 FD: Securing cost efficiency technical appendix, page 22, SOC-2-0008.
[44] Ofwat, December 2024, PR24 FD: Expenditure allowances – base cost modelling decision appendix, FD page 15, SOC-2-0001.
[45] Ofwat, December 2024, PR24 FD: Expenditure allowances – base cost modelling decision appendix, page 15, SOC-2-0001.

Figure 5: Ofwat's principles of PR24 base cost assessment

Source: Ofwat criteria for making changes at PR24 from PR19 base cost models

57. Ofwat specifically introduced a new principle for cost assessment at PR24, that *"data used in our base cost assessment approach is good quality".* Good quality data means that it is accurate, complete and measures the right information.[46] Where good quality data is used, we can be confident that the variable will behave as expected in the econometric models. If data used is not of good quality, there is a material risk that spurious results may arise from the modelling. If the quality of APH data does not demonstrably satisfy this important principle, it is inconceivable that the high bar required for Ofwat to make changes from the PR19 base cost model has been met, and therefore the APH variable should not have been added.

Data quality issues identified with APH in PR19 remained a concern during AMP7

58. Since the PR19 price review concluded, Ofwat has known that data quality has remained an issue for APH. In September 2021, the Cost Assessment Working Group focused explicitly on this variable and ensuring quality data as Ofwat noted that "*APH data quality remains a significant concern*".[47] In 2022, Ofwat commissioned Turner and Townsend to undertake a deep dive study into reporting of APH. Turner and Townsend found that a significant amount of the data is estimated rather than measured and state that there is a "*wide spectrum of maturity across companies in relation to APH reporting methods*".[48] This spectrum of maturity occurs across companies and exists in relation to both APH reporting methods and the availability of suitable live measured data. Turner and Townsend noted that this appears to be driven by variance in the location and quantity of flow or pressure telemetry and the sizes and configurations of pumping assets in place across company value chains.[49] The widespread range in reporting methods is summarised in Table 6:

[46] The Office of National Statistics has prepared guidance to help understand the importance of good quality data for public sector bodies. Gov.uk, May 2021, What is data quality? Routes to good quality data, SOC-2-0012.
[47] Ofwat, September 2021, PR24 cost assessment working group: Average pumping head, connected properties and ensuring quality data, page 9, SOC-2-0013.
[48] Turner and Townsend, March 2022, Average Pumping Head: data quality improvement Ofwat, page 52, SOC-2-0014.
[49] Turner and Townsend, March 2022, Average Pumping Head: data quality improvement Ofwat, page 52, SOC-2-0014.

Table 6: APH reporting methods used per company[50]

	All measured	1	2	3	4	5	6	7	8
Vol	All measured	Using network demand data	Using typical values	Surrogate data from closest point of measurement to the site	Typical flow ranges	-	Historical values of APH	-	Engineer's assessment
Lift	All measured	Using dip test data from borehole level	Calibrated all mains hydraulic model	Using static ground level measurements and standard	Using pump curves to determine the discharge	Using pump power curve overlaid on the	Using pump 'base plate' information	Company standard head losses	Engineer's assessment

Water Company Code	RW Abstraction		RW Transport		Water Treatment		Treated Water Distribution	
	Volume	Lift	Volume	Lift	Volume	Lift	Volume	Lift
B	All Measured	All Measured	All Measured	All Measured	All Measured	All Measured	All Measured	All Measured
E	3	7	3	7	3	7	1	7
F	All Measured	7	2	7	2	8	2	7
G	All Measured	All Measured	All Measured	All Measured	All Measured	All Measured	All Measured	All Measured
H	1 & 3	1	1 & 3	4	1 & 3	4	1 & 3	4
J	All Measured	All Measured	All Measured	All Measured	All Measured	All Measured	Not stated	4
K	All Measured	All Measured	All Measured	All Measured	All Measured	All Measured	Not stated	3
L	1	3	1	3	1	3	1	3
M	All Measured	3	All Measured	All Measured	8	8	All Measured	All Measured
N	4 & 6	7	4 & 6	7	4 & 6	7	4 & 6	7
O	3	2	3	2	3	2	3	2
P	All Measured	4	All Measured	4	All Measured	4	3	4
Q	All Measured	6	All Measured	6	All Measured	6	1	6
R	All Measured	1	All Measured	6	All Measured	6	All Measured	6
V	1 & 3	3 & 7	1 & 3	3 & 7	1 & 3	3 & 7	1 & 3	3 & 7
X	All Measured	All Measured	All Measured	7	All Measured	7	All Measured	7
Z	All Measured	7	All Measured	7	6	7	3	7

Note: Estimation approaches stated by each company for volume and lift.

59. There were significant specific data quality concerns raised through Turner and Townsend's review in 2022:[51]

a) A small number of companies rely heavily on estimated lift data, as opposed to measured.
b) Companies relied on static estimates for components of the calculation that had not been updated for several years. It is therefore likely that the APH reported by these companies is misaligned with current network operating conditions.
c) One company has used a static APH figure for Water Treatment for around 10 years. Other companies have reported very stable figures for shorter periods either in the past or in recent years. Whilst water treatment works typically do not change at a rapid rate, there is an expectation that there would be some incremental changes over time based on works configuration and/or demand changes which are potentially not being reflected by static figures.
d) Even if companies move to using more measured data instead of estimating it is unlikely they will be able to accurately back-cast the measured data. The relationship between measured and estimated data would not be consistent over time.
e) The application of confidence grades does not appear to be consistent across companies. For example, one of the companies with the highest proportion of estimated data reports one of the highest confidence grades. This suggests that Ofwat cannot always rely on confidence grades to give an accurate representation of the accuracy and robustness of each company's approach.[52]

60. These significant concerns indicate that in 2022 the APH data was patently not of sufficiently good quality to include in the base cost assessment models, mirroring the concerns raised during the

[50] Turner and Townsend, March 2022, Average Pumping Head: data quality improvement Ofwat, page 29-30, SOC-2-0014.
[51] Turner and Townsend, March 2022, Average Pumping Head: data quality improvement Ofwat, page 46, SOC-2-0014.
[52] Turner and Townsend, March 2022, Average Pumping Head: data quality improvement Ofwat, page 46, SOC-2-0014.

PR19 process and CMA PR19 Redetermination.[53] Ofwat has not commissioned a follow-up report since 2022, which makes it impossible for an independent assessment to conclude which of these identified concerns have been alleviated and which remain.

Ofwat's assertions regarding improved APH data quality in recent years are unsupported and cannot alleviate the fundamental data quality concerns over the entire modelling period

61. Following the submission of 2023-24 Annual Performance Report (**APR**) data, Ofwat asked companies on a bilateral basis to provide an update on the proportion of sites where APH calculation data is measured or estimated. Ofwat then stated that the "*data shows that most companies have seen an increase in measured data"* since the responses to the Turner & Townsend report.[54] However, no information has been shared across the industry to allow companies to assess the level of improvement. Ofwat concluded that *"significant APH data quality improvements have been made in recent years",*[55] but it is impossible to confirm the level of these improvements and whether they alleviate the fundamental concerns raised by Turner and Townsend in 2022. Ofwat itself acknowledged that despite these increases, the sector still has some way to go to reach the target of 80% measured inputs[56] – implicitly conceding that data quality remains a concern.

62. Without access to the up-to-date information on which Ofwat based its assessment, it is difficult for us to assess the extent to which the data quality over the entire time series has improved. We have, however, been able to review the APH data provided as part of the APR for the most recent years and assess whether it is better correlated with the energy cost for treated water distribution. If data was of good quality, we would expect that the APH variable should be strongly correlated with energy costs per household, as network topography can determine the extent of pumping required to transport water. Conversely, there would inevitably be a weaker correlation if the data is of poor quality.

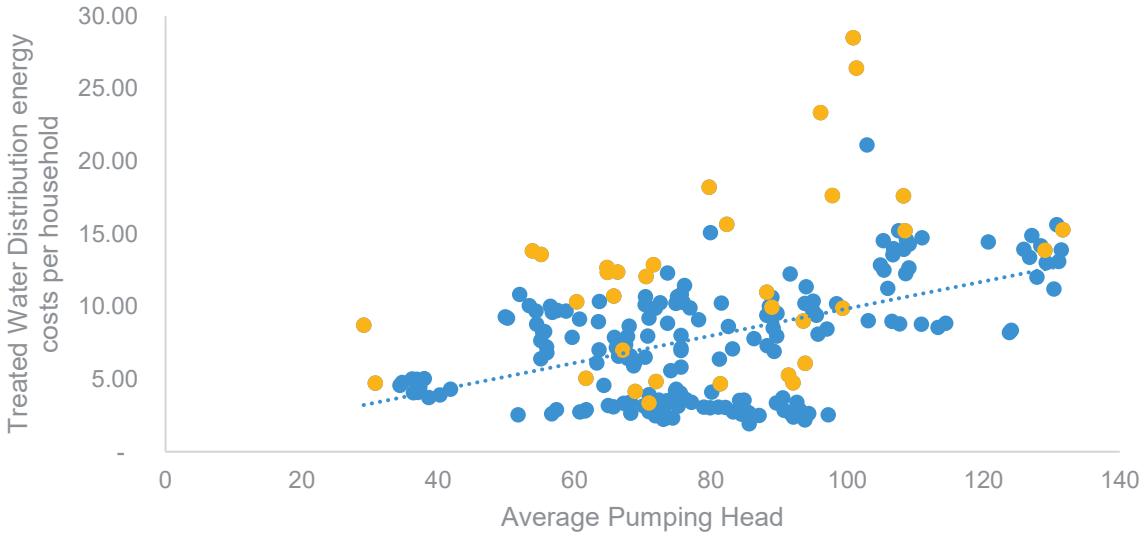
63. We find that there is only a medium-level correlation across the entire modelling period. The correlation coefficient (which measures the proportion of variation that is explained) is only 0.45 in the Treated Water Distribution model and 0.37 in the Wholesale Water model.[57] This modest level of correlation is unsurprising given the data quality issues with the APH variable. This lack of correlation is visible in Figure 6 and Figure 7, in which most of the data points do not follow the upward-sloping line of best fit. In these charts the orange dots represent APH data from the two most recent APRs.

64. What is more concerning is that this correlation in fact weakens in the two most recent years of APR data since the publication of the Turner and Townsend report. Over just the two most recent years, the correlation coefficient falls from 0.45 to 0.41 in the Treated Water Distribution model and from 0.37 to 0.36 in the Wholesale Water model.[58] This can be seen visually on the charts as the orange dots are further away from the line of best fit. If the data was better quality in recent years as Ofwat has indicated, we would expect to see an increasing correlation. The reduced correlation implies that the impact of any increase in measured data across the sector is limited and it is

[53] CMA, March 2021, Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations, page 142, para 4.84, SOC-2-0009.
[54] Ofwat, December 2024, PR24 FD: Expenditure allowances – base cost modelling decision appendix, page 23, SOC-2-0001.
[55] Ofwat, December 2024, PR24 FD: Expenditure allowances – base cost modelling decision appendix, page 23, SOC-2-0001.
[56] Ofwat, December 2024, PR24 FD: Expenditure allowances – base cost modelling decision appendix, page 23, SOC-2-0001.
[57] Southern Water, Error 2 - APH Final - Southern Water analysis, worksheet "APH vs power cost, per HH", SOC-2-0068.
[58] Southern Water, Error 2 - APH Final - Southern Water analysis, worksheet "APH vs power cost, per HH", SOC-2-0068.

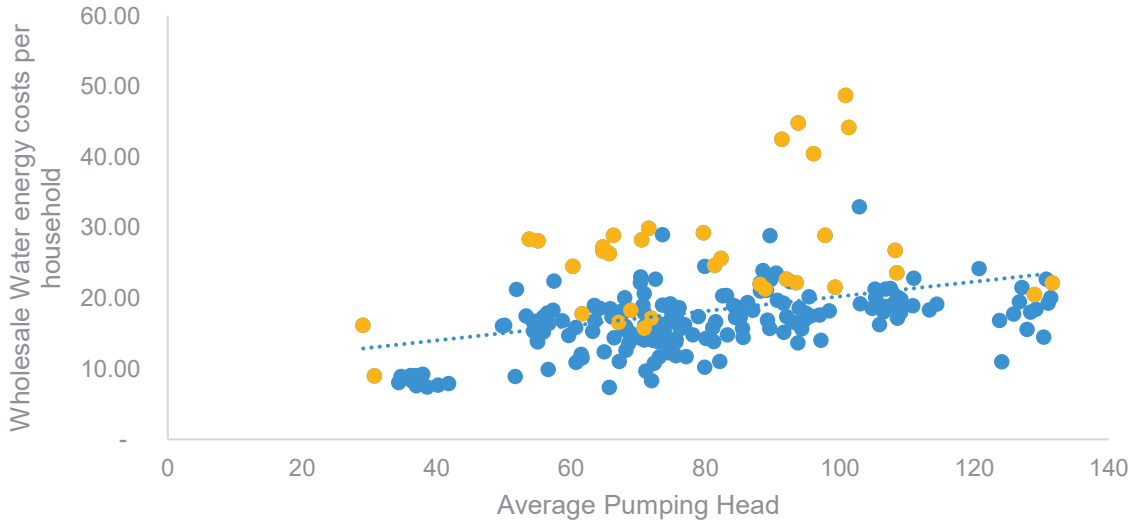
certainly not enough to alleviate the fundamental concerns raised concerning the variable for these years.

Figure 6: Correlation between APH and Treated Water Distribution energy costs per household



Source: Southern Water analysis[59]
Note: Blue dots represent data points from 2012/12 to 2021/22. Orange dots represent data points from 2022/23 to 2023/24

Figure 7: Correlation between APH and Wholesale water energy costs per household



Source: Southern Water analysis[60]
Note: Blue dots represent data points from 2012/12 to 2021/22. Orange dots represent data points from

[59] Southern Water, Error 2 - APH Final - Southern Water analysis, worksheet "APH vs power cost, per HH", SOC-2-0068.
[60] Southern Water, Error 2 - APH Final - Southern Water analysis, worksheet "APH vs power cost, per HH", SOC-2-0068.

2022/23 to 2023/24

65. More fundamentally, even if the data was of sufficiently good quality over the most recent years (which the available evidence indicates it is not), the vast majority of the datapoints that are included in the base cost models are from prior to the Turner and Townsend report when there were significant data quality concerns. No attempt has been made by Ofwat to correct for these documented data issues from previous years. It would be inappropriate to include this variable in the model until the data was of good quality across the entirety of the modelling period.

Ofwat's triangulation approach goes against its stated principles

66. Ofwat justified the renewed use of the APH variable by noting that stakeholder representations on the appropriate variable to include were mixed, with some supporting each potential variable. It sought to draw upon the distinct benefits of each variable, hoping that including both would balance out any concerns and support a triangulation approach.

67. As Ofwat has noted in its FD, APH has a stronger engineering rationale than the booster pumping stations variable.[61] However, there is still a strong justification for using the booster pumping stations variable – for the exact same reasons as found by Ofwat and the CMA at PR19. The stronger engineering rationale for APH does not counterbalance the significant data quality issues associated with this variable, as these issues effectively make the variable inappropriate to use in accordance with Ofwat's first modelling principle (see Figure 5).

68. Moreover, from an econometric perspective, both models perform strongly and are viable candidates to include in the modelling suite, but it certainly cannot be argued that APH is superior. The inclusion of the APH variable worsens the performance of the complexity drivers as shown in Table 7 below.

Table 7: APH impact on complexity drivers

	Wholesale Water											
Topography Explanatory Variable	Booster Pumping Stations	APH	Booster Pumping Stations	APH	Booster Pumping Stations	APH	Booster Pumping Stations	APH	Booster Pumping Stations	APH	Booster Pumping Stations	APH
Complexity Driver Explanatory Variable	Water treated at complexity levels 3 to 6 (%)	Water treated at complexity levels 3 to 6 (%)	Weighted average treatment complexity (log)	Weighted average treatment complexity (log)	Water treated at complexity levels 3 to 6 (%)	Water treated at complexity levels 3 to 6 (%)	Weighted average treatment complexity (log)	Weighted average treatment complexity (log)	Water treated at complexity levels 3 to 6 (%)	Water treated at complexity levels 3 to 6 (%)	Weighted average treatment complexity (log)	Weighted average treatment complexity (log)
Model Reference	WW1	WW7	WW2	WW8	WW3	WW9	WW4	WW10	WW5	WW11	WW6	WW12
P value	0.000	0.001	0.029	0.085	0.008	0.055	0.043	0.106	0.001	0.005	0.015	0.042
Difference	0.001		0.056		0.047		0.063		0.004		0.027	
Stars	***	***	**	*	***	*	**		***	***	**	*
Stars difference			*		**		**				*	

Interpretation:

Difference	Positive value means APH worsens complexity drivers	
Red	-->	Significance is worse with APH
Green	-->	Significance is better with APH

Stars difference		Loss of significance for complexity drivers
***	3 stars are lost	Larger
**	2 stars are lost	
*	1 star is lost	Smaller
	No stars are lost	None
	Stars are gained	

Note: * = p < 0.10 (90% confidence). ** = p < 0.05 (95% confidence). *** = p < 0.01 (99% confidence). Red highlights indicate that complexity drivers' significance is worse with APH variable included

69. As an example, the difference between model WW3 and model WW9 is including the APH variable as opposed to the booster pumping station variable. The p value for the "Water treated at

[61] Ofwat, December 2024, PR24 FD: Expenditure allowances – base cost modelling decision appendix, page 22, SOC-2-0001.Ofwat explain that this is because *"it is a more direct measure of pumping requirements as it captures the volume of water pumped and the pressure at which it is pumped"*

complexity levels 3 to 6 (%)" variable to explain complexity falls from a three-star rating of 0.008 (i.e. we have more than 99% confidence) to only a one-star rating of 0.055 (i.e. we have only a 90% confidence). This is a significant reduction in the confidence level and similar results are seen when comparing across all the models. This is potentially concerning given these complexity drivers are key to the engineering rationale of the model.

70. Moreover, the efficiency scores also worsen significantly in the wholesale models when APH is included. This is shown in Table 8.

Table 8: Impact of APH variable on efficiency scores

	Treated Water Distribution						Wholesale Water											
Topography Explanatory Variable	Booster Pumping Stations	APH	Booster Pumping Stations	APH	Booster Pumping Stations	APH	Booster Pumping Stations	APH	Booster Pumping Stations	APH	Booster Pumping Stations	APH	Booster Pumping Stations	APH	Booster Pumping Stations	APH	Booster Pumping Stations	APH
Model Reference	TWD1	TWD4	TWD2	TWD5	TWD3	TWD6	WW1	WW7	WW2	WW8	WW3	WW9	WW4	WW10	WW5	WW11	WW6	WW12
Range	0.482	0.497	0.630	0.487	0.656	0.423	0.685	0.982	0.711	0.968	0.720	0.915	0.729	0.913	0.740	0.942	0.704	0.928
Difference	0.016		-0.142		-0.233		0.297		0.257		0.194		0.184		0.202		0.224	
% Difference	3%		-23%		-36%		43%		36%		27%		25%		27%		32%	

Interpretation:
Green --> Efficiency score is lower / better with APH variable
Red --> Efficiency score is higher / worse with APH variable

Note: Green text indicates efficiency score is better in model with APH variable, red text indicates efficiency score is worse in model with APH variable

71. These results collectively imply that, from an econometric perspective, whilst the models do perform strongly, the APH variable is not as strong as the Booster pumping variable and its inclusion in the models therefore weakens the overall strength of the models.

72. Given the wider, more fundamental concerns related to the data quality of the APH variable being unreliable, there is also a risk in giving too much credence to the overall performance of that variable in the econometric models. This is because these econometric results could be spuriously strong due to the presence of many estimated data points.

73. To summarise, although there are two potential variables that could be included in the models to explain network topology i.e. APH and Booster pumping, one of them (APH) remains subject to a significant issue remaining related to data quality (as it was for PR19), whereas the other (Booster pumping) is not subject to any significant issues. These significant data issues outweigh any advantage that APH might have in terms of its engineering rationale. With that context, it is clear that Ofwat has made an error in triangulating across these two variables.

74. Ofwat stated in the FD that "*Our decision to triangulate across a range of TWD and WW models – 50 percent that include APH TWD and 50 percent that includes booster pumping stations per length of mains – balances the pros and cons of each measure".*[62] However, including APH at all within the modelling suite is inappropriate when, as the CMA already concluded in the CMA PR19 Redetermination, *"a superior alternative was available".*[63] Including the APH variable goes against Ofwat's own modelling principles. Furthermore, the high bar which Ofwat has set itself to make changes to the modelling suite at PR24 means that it is even more inappropriate to include this variable now – given it was excluded at the last price control.

[62] Ofwat, December 2024, PR24 FD: Expenditure allowances – base cost modelling decision appendix, page 23, SOC-2-0001.
[63] CMA, March 2021, Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations, page 141, para 4.83, SOC-2-0009.

Ofwat's error has given rise to a material shortfall in our base cost allowance

75. Ofwat erred in including the APH variable in three treated water distribution models and six wholesale water models. To assess the materiality of this error, we have conducted our own modelling which corrects for this error and removes these models from the models that are triangulated to determine the water allowance.[64]

76. Re-running the econometric models and correcting for this error leads to a £53m increase in our wholesale water base cost allowance.

Required Remedy

77. It is important that only strong robust models are included in the PR24 modelling suite. Only models that pass the model robustness test should be included. Only variables that include good quality data should be included. This ensures that the models will most effectively determine the efficient level of expenditure for each company. This in turn will provide confidence that all companies can fund the base costs needed to deliver a strong level of customer service.

78. To remedy the error identified, only three models are required at the Treated water distribution level of cost aggregation. These models should contain the following explanatory variables:

- **Length of the potable water mains** – as an explanatory driver to explain scale
- **Booster pumping stations per length of mains** – as an explanatory driver to explain network topography
- Weighted average density – LAD from MSOA (+ quadratic term), Weighted average density – MSOA (+ quadratic term) and Properties per length of mains (+ quadratic term) – as explanatory variables to explain population density

79. Only six models are required at the Wholesale water level of cost aggregation. These models should contain the following explanatory variables:

- **Number of properties**– as an explanatory driver to explain scale
- **Proportion of water treated at complexity levels from 3 to 6 and Weighted average treatment complexity -** as an explanatory driver to explain treatment complexity
- **Booster pumping stations per length of mains–** as an explanatory driver to explain network topography
- **Weighted average density – LAD from MSOA (+ quadratic term), Weighted average density – MSOA (+ quadratic term) and Properties per length of mains (+ quadratic term)** – as explanatory variables to explain population density

80. The efficient level of expenditure for each company is determined by re-running Ofwat's FD models with these corrected variables and the triangulated the results with the other water models. With this error corrected, Southern Water's wholesale water base cost allowance increases by £53 million.

[64] Southern Water, Error 2 - APH Final - Southern Water analysis, worksheet "Final allowances", SOC-2-0068.

81. We request that the CMA amend Ofwat's modelling suite as described above and therefore that our base cost allowance is increased accordingly.

3. Cost Adjustment Claims

Ofwat uses the Cost Adjustment Claims framework to fund expenditure to address companies' unique circumstances

82. For PR24, Ofwat used a suite of econometric models to set base cost allowances. These are industry-wide models and do not account for our unique characteristics as a water and sewerage company operating within the South East of England, which increase our true level of efficient expenditure. In recognition of the limitations of base cost models, Ofwat's Cost Adjustment Claim (CAC) framework[65] exists to fund expenditure not captured by base cost models.

83. To determine whether a cost adjustment claim was successful, Ofwat took each claim through two assessment gates:
   i) Need for adjustment: Companies had to evidence why the industry-wide econometric models did not adequately capture their unique circumstances. Companies had to demonstrate that the issue was outside management control and material to the company. Ofwat also expected companies to demonstrate that the base cost allowance would be insufficient to accommodate these unique circumstances without the claim.
   ii) Cost Efficiency: Companies had to provide compelling evidence that the cost estimates were efficient, and clearly explain how they arrived at the cost estimate

84. We support the need for the cost adjustment claims process and the principles of the assessment framework that Ofwat has in place to assess these fairly. However, whilst we believe that it is crucial that companies do demonstrate that there is a need for an adjustment, Ofwat's specific application of these principles was carried out incorrectly.

85. In addition to expecting companies to demonstrate how their unique circumstances were not captured within the base models, Ofwat stated that it *"also expected companies to demonstrate that the base cost allowance would be insufficient to accommodate the special factor without the claim."*[66] Whilst we accept that it is important to quantify the implicit allowance related to a specific adjustment, Ofwat also sometimes rejected claims based on the view that the factor in question would be adequately covered by the overall allowance for the relevant part of the price control (i.e. including both base costs and enhancement costs). Despite this, the level of the overall modelled allowance does not demonstrate that the models are adequate to cover our specific unique circumstances.

86. Overall, Ofwat noted that it received sixty-four CACs in the PR24 business plans, amounting to an aggregate request of £5.4 billion of additional allowance.[67] Ofwat accepted or partially accepted only eight company specific claims, providing only £103m in additional company specific allowances (approximately 2% of what was requested).[68] The fact that Ofwat only accepted such a

[65] Ofwat, February 2025, PR24 FD Expenditure allowances, page 27-31, SOC-1-0006.
[66] Ofwat, February 2025, PR24 FD Expenditure allowances, page 30, SOC-1-0006.
[67] Ofwat, February 2025, PR24 FD Expenditure allowances, page 29, SOC-1-0006.
[68] Based on review of Ofwat, PR24 cost adjustment claim feeder models, SOC-2-0044.

small number of CACs, representing a fraction of the overall requested amount, indicates that Ofwat's acceptance criteria are overly skewed towards rejecting claims. At PR19, Ofwat accepted nineteen company specific claims out of sixty two claims submitted[69].

87. We submitted seven CACs to Ofwat within our DD Response. Ofwat rejected four of these CACs, taking the view that we had failed both the need for adjustment and cost efficiency gates of each. Only one of our claims was accepted as a company specific claim (the remaining two being partially addressed by way of a sector-wide adjustment). The status of each claim is set out in Table 9 below.

Table 9: Summary of Southern Water's Cost Adjustment

Cost Adjustment Claim	Price Control	Net Value of Claim	Ofwat CAC Allowance	Ofwat Status
SRN_CAC1 Meter Replacement	Wholesale water	£109m	£0m	Sector-wide adjustment
SRN_CAC2 Regional Labour Costs	Wholesale water	£21m	£0m	Rejected
SRN_CAC3 Regional Labour Costs	Wastewater network plus	£66m	£0m	Rejected
SRN_CAC4 Wastewater Growth	Wastewater network plus	£50m	£0m	Sector-wide adjustment
SRN_CAC5 Advanced Anaerobic digestion at Ashford and Ham Hill	Bioresources	£108m	£0m	Rejected
SRN_CAC6 Coastal Population	Wastewater network plus	£65m	£0m	Rejected
SRN_CAC7 Economies of scale at water treatment works	Wholesale water	£24m	£19m	Accepted

Note: Seven Southern Water CACs were submitted to Ofwat for a total claim of £443m; two were assessed through a sector-wide adjustment and only one CAC was accepted and received an allowance of £19m.

88. In its evaluation of the needs for adjustment, Ofwat frequently undertook its own analysis, grounded on tenuous assumptions or methodologies. As a result, it arrived at conclusions that were contrary to, or inconclusive when taken together with, the compelling evidence we provided. Ofwat then used these findings as a rationale to disregard evidence and treat this assessment gate as having been failed.

89. Ofwat also took this approach to the cost efficiency assessment gate, where it applied its own methodologies based on unsupported assumptions, which led to results which differed to the robust evidence of cost efficiency we had provided.

90. In adopting this approach in the FD, Ofwat erred in its application of the CAC framework and failed to provide efficient expenditure allowances where base models did not provide sufficient funding. In particular, Ofwat made the following errors:~

[69] Ofwat, December 2019, PR19 FD: Securing cost efficiency technical appendix, page 136, SOC-2-0008.

a) First, Ofwat selectively used tenuous methodologies containing erroneous assumptions to dispute and dismiss our claims, despite robust quantitative and engineering evidence supporting them.
b) Second, Ofwat assessed and rejected our CACs on an inconsistent basis with similar claims made by other companies. This demonstrates that Ofwat failed to acknowledge compelling evidence on drivers of cost not accounted for by base models and thereby reduced costs beyond efficient levels in a discretionary manner unguided by evidence.
c) Thirdly, Ofwat incorrectly assessed materiality by reference to totex, rather than base costs which is the correct basis for the CACs process.

3.1.1. Error 3: Not accepting our cost adjustment claim to facilitate the introduction of advanced anaerobic digestion (AAD) at the company's Ham Hill and Ashford sludge treatment centres

The issue

91. Sewage sludge is the semi-solid by-product of wastewater treatment processing. We recycle one hundred percent of our sludge to agriculture compared to the sector average of 95 percent.[70] Our bioresources services involve the transport, treatment, recycling, and disposal of sewage sludges. These activities fall within our regulated activities as a sewerage undertaker. We have developed a Bioresources Management Strategy[71] that seeks to maximise value for the environment and our customers through the use of efficient and adaptive solutions.

92. Our unique position as a company operating between London and the coast imposes cost pressures on our bioresources operations. This is due to increased sludge disposal complexity, which is beyond management control. Key drivers of this complexity include limited land bank availability, a dispersed population, evolving environmental regulations, and decreasing farmer satisfaction with biosolids use. Base models do not capture these features and thereby fail to set adequate allowances for investment at AMP8.

93. Following the emergence of external cost pressures and an ageing asset base, we have endeavoured to adopt a strategy that minimises the costs of our bioresources operations.[72] Our decision to pursue efficiency is aligned with Ofwat's cost assessment framework which challenges us to reduce costs in the interest of consumers.[73] Our sludge treatment processes are more within management control than are sludge transport and sludge disposal operations. Sludge transport and disposal are heavily influenced by the geographical features of our region and environmental legislation. Sludge treatment operations offer a viable avenue to improve the efficiency of our bioresources operations in the presence of external cost pressures.

94. We have historically controlled sludge treatment costs by maximising the full economic life of our Conventional Anaerobic Digestion (**CAD**) treatment technologies. These assets are now at the end of their economic life and the maintenance needs and associated running costs are growing[74] (see Figure 10 below).

[70] Southern Water, APR extract sludge recycled to farmland, table 8D, SOC-2-0078.
[71] Southern Water, October 2023, SRN36 Bioresources Strategy Technical Annex, SOC-2-0016.
[72] Southern Water, August 2024, SRN-DDR-016: Bioresources AAD Cost Adjustment Claim, page 9, SOC-2-0018.
[73] Ofwat, December 2024, PR24 Final Determinations Expenditure allowances, SOC-1-0006.
[74] Southern Water, 2024, Internal analysis of CAD CHP engines, SOC-2-0083.

95. It is necessary to replace CAD assets with new treatment technologies for two reasons. Firstly, it is inefficient to maintain CAD assets any longer given the expensive running costs. Secondly, these assets have incurred significant mechanical stress over their lifetime and the associated quality of the sludge they produce has diminished. This limits the scope to recycle sludge over arable land as farmers require high quality biosolids that adheres to current and incoming environmental legislation.

96. We have undertaken an optioneering exercise to identify the optimal replacement solution for our existing CAD assets to bolster our sludge treatment operations and promote long term efficiency for customers. This identified that a step-change investment in Advanced Anaerobic Digestion (**AAD**) is the optimal replacement solution. This solution consolidates our sludge treatment operations within two sludge treatment centres (**STCs**) in Kent.

97. This investment cannot be funded through the base allowance, which

98. estimate to provide a £11.5m implicit allowance (before frontier shift and catch-up is applied) for AAD investment.[75] This implicit allowance covers roughly one tenth of the required investment.

99. Despite the materiality, need and compelling justification for our claim, Ofwat rejected our CAC. The predominant reasoning Ofwat provided was that this could be funded through base allowances following the inclusion of sludge quality enhancement expenditure within base models at FD. The rejection of this CAC prevents investment in AAD sludge treatment technology and forgoes the timely replacement of ageing CAD assets which can no longer be maintained in a cost-efficient manner.

100. Ofwat's decision prevents us from enhancing the quality and efficiency of our bioresources activities which, given the health of our CAD assets, will continue to atrophy. This will impact farmers operating in our regions as the quality of sludge product for recycling over arable land deteriorates. An ageing sludge treatment asset base creates risks and hinders the creation of a suitably robust contingency measures to manage the impacts of climate change and periods of supply chain disruption.

101. Our CAD assets now cannot be maintained any longer and it is the opportune time to invest in new sludge treatment technologies. Our optioneering has determined that consolidating our Kent bioresources operations through investing in AAD technology at two sites is the most cost-effective option. This option will strengthen the resilience of our sludge management chain for our customers as we face increasing climate risk (particularly from greater flooding) which will test the resilience of our operations and necessitates sustainable solutions.[76]

102. Ofwat's error has arisen due to the omission of the following factors, which we breakdown in more detail, alongside supporting evidence below:

a) Bioresources base models do not capture recent cost pressures within our operations driven by high sludge disposal complexity and have thereby underfunded us.

b) Bioresources base models do not account for the evolving cost of sludge treatment technologies throughout their lifetime. These models have historically underfunded

[75] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 9, SOC-2-0065.
[76] Southern Water, August 2024, SRN-DDR-016: Bioresources AAD Cost Adjustment Claim, pages 18-24, SOC-2-0018.

companies with older sludge treatment assets given the lack of a funding channel for increasing capital maintenance costs.

c) For PR24, bioresources base models did not capture significant investments made in AAD across the sector and therefore cannot grant sufficient allowance for sludge treatment enhancement. Econometric panel models rely on input data containing repeated observations of expenditure across companies and over time to make accurate predictions about the future. If econometric models are calibrated based on incomplete or patchy expenditure data for a specific activity, then the associated modelled allowance will be biased downwards.

d) In the FD, Ofwat has allowed AAD investment falling outside the scope of modelled base allowances for Thames Water through the Large Scheme Gated Process[77] despite rejecting our claim on the basis that it can be funded via modelled allowances. In accepting Thames Water's scheme Ofwat has acknowledged that AAD investment cannot be funded solely through base allowances in certain instances.

Summary of previous representations

103. In our October 2023 Business Plan submission, we requested £112.8 million[78] to fund a step-change investment in AAD technology at two of our STCs in Kent.[79] This funding was sought as an adjustment to our base allowances via a bioresources CAC. In the DD, Ofwat initially reallocated our base funding request to enhancement and subsequently rejected it on the grounds that it did not meet the enhancement criteria.

104. Following the rejection of our initial CAC, we submitted a revised CAC for £108 million as part of our DD Response. The reduction in the claim value reflected the inclusion of an implicit allowance for avoided future capital maintenance in AMP8, following the closure of existing CAD assets.

105. The revised submission included additional evidence to support the needs case, highlighting why bioresources base models have historically failed to compensate us for our unique characteristics as a business situated between London and the South East coast. In the FD, Ofwat reallocated the scope of this expenditure back to base, although the initial CAC was moved from base and then subsequently rejected at DD for not meeting enhancement criteria.[80]

106. In the FD, Ofwat rejected the CAC again, citing failures in both the need for adjustment and cost efficiency assessment gates. Its justification was primarily based on the assumption that base bioresources models will provide companies with sufficient allowances for AAD investment going forward, following its decision to include sludge quality enhancement (the cost pool for our proposed investment in AAD) within the scope of base costs.

Ofwat's bioresources base models do not capture our high sludge disposal complexity which has led to historical underfunding

107. Ofwat has failed to acknowledge the evidence we have provided on the unique features of our business, such as our position between London and the coast, which drive higher sludge disposal

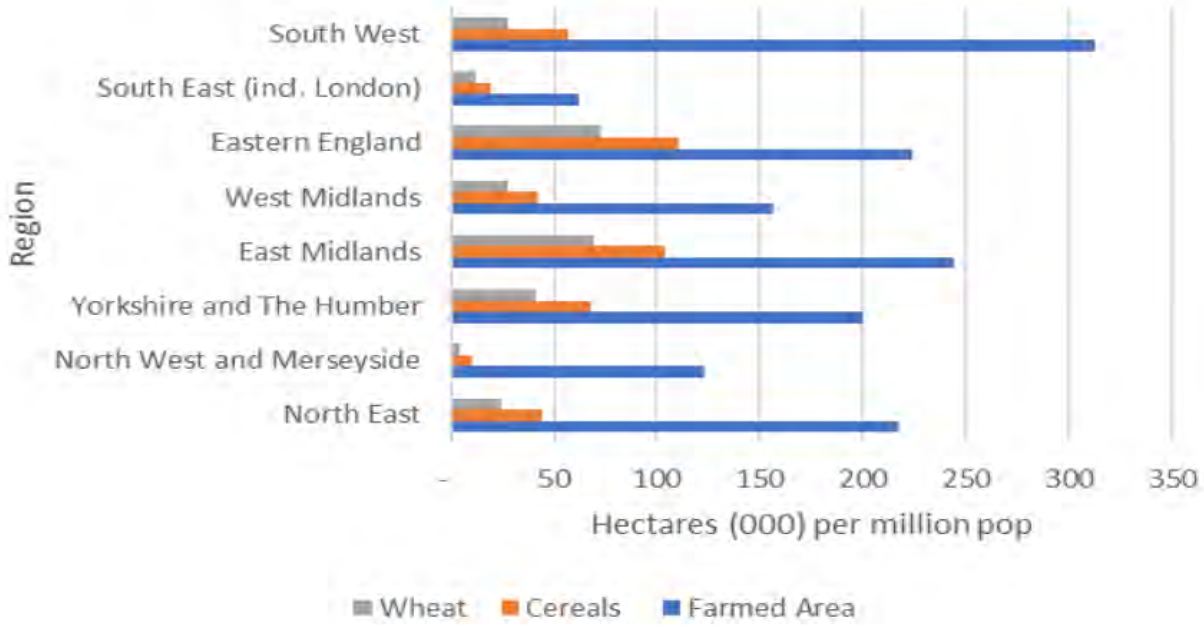
[77] Ofwat, December 2024, Overview of Thames Water's PR24 final determination, page 4, SOC-2-0017.
[78] Southern Water, August 2024, SRN-DDR-016: Bioresources AAD Cost Adjustment Claim, SOC-2-0018.
[79] Southern Water, October 2023, Five-year Business Plan 2025–30, page 142, SOC-2-0019.
[80] Ofwat, December 2024, SRN CAC Feeder Model Code: PR24CA19, SOC-2-0020.

complexity in the FD. Our region in the South East contains the smallest farmed area in total of all UK regions relative to the population served (see Figure 8: below). This limits the scope we have to select low-cost options for recycling sludge to agriculture.

108. Approximately 46% of the farmed area comprising our landbank is less than 20 hectares with 80% spanning less than 100 hectares.[81] A greater proportion of smaller plots of land within our region means we face constraints in disposing sludge as there is greater risk of compliance with stringent environmental regulations. This presents logistical challenges as we must travel further distances to the limited number of suitable landbanks we can dispose sludge to in a compliant manner. This adds complexity to our sludge management operations and limits scope to achieve efficiencies in transport and disposal activities, given that the location of our operational bases cannot be easily changed in practice. Companies with greater area of available arable land on which to recycle sludge have greater opportunity to optimise activities by disposing of sludge at landbanks which are more easily accessed from existing bases of operations.

109. As demonstrated by Figure 8: below, when adjusted by population, the region we operate in has a considerably smaller area of land available for biosolids recycling compared to our peers.

Figure 8: Available land area for biosolids recycling by region adjusted for population



Source: Farming statistics – land use, livestock populations and agricultural workforce, Department for Environment, Food & Rural Affairs

110. As a result of the physical limitations of our landbank and dense biosolids load, we must store and transport higher volumes of biosolids. This means we must travel further distances to dispose of biosolids. This drives higher disposal and transport costs relative to companies with more accessible landbanks. This leads us to incur increased diesel costs. In 2022/23, we spent approximately £8.3m on diesel alone after consuming roughly 5.8m litres of diesel moving sludge

[81] DEFRA, October 2024, Agricultural facts: South East (including London) region, page 3, SOC-1-0015.

and biosolids between our sites and disposal fields.[82] The emissions resulting from our fuel consumption presents an environmental challenge and exposes us to price volatility in diesel. We now wish to remedy these environmental and economic challenges through investing in AAD and enhancing the sustainability of our sludge management chain.

111. Complexity is further compounded by the evolving regulatory landscape arising from new initiatives such as DEFRA's Chemicals Strategy and the Environment Agency's Sustainable Sludge Strategy with which our operations must comply. We are more exposed to the impact of these regulations than the notional water and sewerage company as we dispose a higher proportion of our sludge to agriculture compared to the sector average.[83] Adherence to legal obligations and industry standards requires careful control and monitoring of our handling, treatment and management of sludge. We must ensure we have the necessary procedures, equipment and technology to meet required interventions to maintain and improve our operations. More legislative requirements have been introduced over time which has subsequently created additional compliance costs.[84]

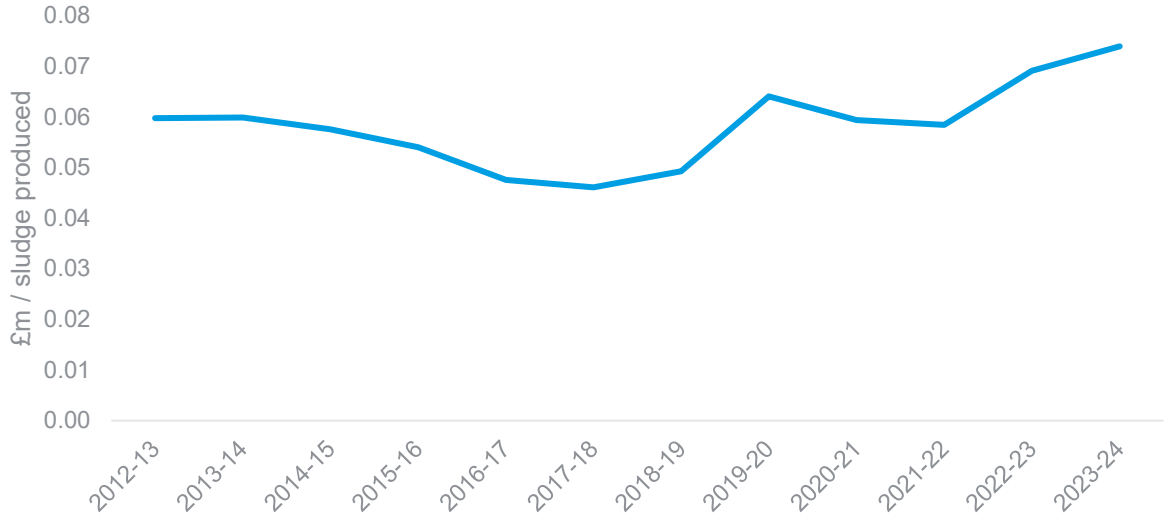
112. The above factors are not accounted for explicitly within PR24 base models which includes cost drivers capturing economies of scale, such as population density, whilst omitting cost drivers which capture the relative sludge disposal complexity between companies and the evolving regulatory landscape. KPMG analysed our sludge disposal unit costs over time.[85]. Figure 9 below shows that our unit cost of sludge disposal that has increased since 2017/18. This reflects the impact of increasing sludge disposal complexity.

[82] Southern Water, August 2024, SRN-DDR-016: Bioresources AAD Cost Adjustment Claim, SOC-2-0018.
[83] See paragraph 91
[84] Key legislation, includes, but is not restricted to:

a) Sludge Agriculture Regulations 1989
b) Environmental Permitting Regulations 2010
c) Industrial Emissions Directive Regulations 2013
d) The Control of Major Accident Hazards Regulations 2015
e) Reduction and Prevention of Agricultural Diffuse Pollution Regulations 2018

[85] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 14, SOC-2-0065.

Figure 9: Southern Water Sludge disposal unit cost (per tonne of sludge produced), (£m, 2022/23 prices)



Source: KPMG Analysis

113. Our strategy has been to minimise costs in the interests of our customers, and for this reason the cost pressures emerging within our sludge disposal and transportation operations influenced our decisions to defer investment in treatment technologies such as AAD. This strategy was aligned with Ofwat's cost assessment framework which incentivises us to pursue efficiency in the face of cost pressures. This decision to defer investment whilst our CAD assets were healthy was therefore a strategically sound strategy which maximised value for our customers.

Ofwat's bioresources base models have historically underfunded our increasing capital maintenance costs

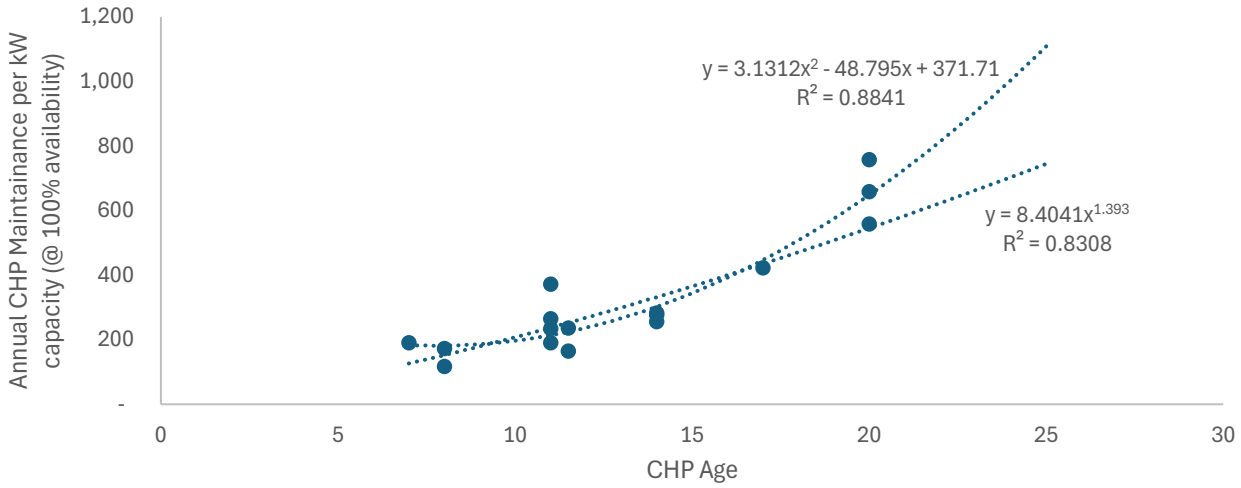
114. The performance of sludge treatment technologies gradually deteriorates over the course of the asset's economic life. This is because the cumulation of mechanical stress over an extended period necessitates more regular maintenance of an asset. Operating costs therefore increase throughout the duration of the asset lifecycle.

115. Already in our business plan for PR19 we noted that we forecast a need for investment and additional treatment works in the medium term by AMP8 and the potential to adopt advanced digestion technology.[86] Our CAD technologies are now approaching the end of their useful economic life. This approach has maximised the value of our investment in CAD assets for our customers. As these assets have now reached the end of their intended lifecycle, they have become increasingly expensive to operate. The quality of the sludge they produce has also worsened. If we do not replace these assets the effectiveness and efficiency of our sludge treatment activities will diminish as the ageing CAD assets will require increasingly costly input for the same, or lower, level of output. This costly approach would not be in the interest of our customers or the resilience of our bioresources operations.

[86] Southern Water, September 2018, TA.12.BR01 Bioresources Treatment and Growth Business Case, page 33, SOC-2-0045.

116. Figure 10 below presents analysis[87] conducted on the evolving maintenance costs of our CAD Combined Heat and Power (**CHP**) assets over the course of their 25-year lifetime. It demonstrates how maintenance costs increase significantly over the course of an asset's lifetime.

Figure 10: Maintenance cost per kWh of capacity of Southern Water's CHP engines over their lifetime



Note: As engine age increases, the maintenance cost per kWh increases - Internal Southern Water analysis

117. Ofwat's bioresources base models do not include cost drivers related to treatment technology (e.g. CAD vs AAD), asset health or capital maintenance requirements. The 13-year modelling period does not capture an entire sludge treatment asset lifecycle which is typically 25-years. This means that Ofwat's base models do not capture cost drivers related to asset health or the characteristics of the treatment solution.

118. Base models do not account for the sludge treatment technology used (e.g. distinguishing between CAD and AAD). Ofwat has indicated that it perceives the selection of treatment technology as being within management control. This is incorrect. We face financial constraints which limit our ability to invest in new treatment solutions, while at the same time our past investments in CAD represent a significant sunk cost. It is therefore rational that we should maximise the value of this investments for our customers rather than prematurely investing in new solutions whilst current ones are in place, otherwise our customers would effectively pay twice for the same service.

119. Our decision to maintain CAD assets has been a practical and cost-effective approach. Ofwat's models are not designed to recognise the technology of sludge treatment used and cannot distinguish higher efficient costs arising from older assets from those arising from genuine operational inefficiency. Companies who have recently adopted AAD are also still in the low-cost phase of the asset life cycle. This discrepancy is further amplified by the operating cost-saving features of AAD as this technology generates heat and power as a byproduct of sludge treatment.

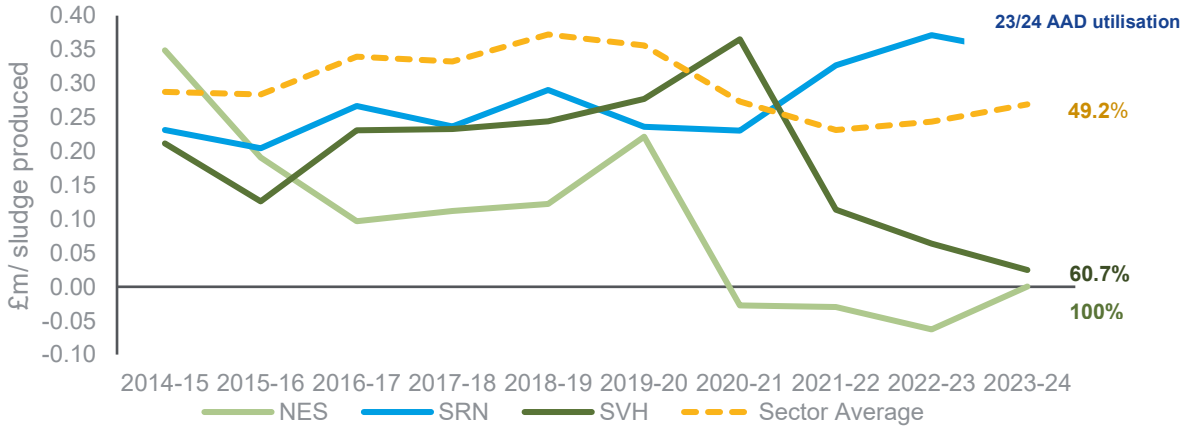
120. Taken together, these factors mean that companies that have adopted AAD more recently will perform favourably in comparative benchmarking compared with those with higher utilisations of

[87] Southern Water, 2024, Internal analysis of CAD CHP engines, SOC-2-0083.

older CAD assets. Companies with older asset bases (i.e. CAD) face further funding challenges than those that have adopted AAD more recently. Companies will naturally occupy different points in their respective assets' lifecycles because investment opportunities and adoption timelines are influenced by a range of company-specific circumstances. The adoption of a certain technology by one company at a point in time does not indicate more efficient decision making. Companies demonstrating prudent asset management by maximising the lifespan of existing treatment technologies should be recognised for pursuing long-term operational efficiency, rather than being disadvantaged during benchmarking due to short-term factors.

121. Robust benchmarking models rely on stable relationships between costs and cost drivers over time and between companies. This relationship is not stable in Ofwat's FD bioresources models because the different technology mixes across companies leads to different operating costs for sludge treatment. This is illustrated in Figure 11 below which shows that companies with higher adoption of AAD, such as Northumbrian Water and Severn Trent, have significantly lower or even negative sludge treatment unit costs, since the AAD sites were operational from 2014 onwards. Our unit costs are by contrast higher than the sector average.[88]

Figure 11: Sludge treatment unit costs (per sludge produced), 2014/15 -2023/24



Source: KPMG Analysis

PR24 base models do not capture significant investments in AAD made across the sector

122. The accuracy of base cost models in forecasting efficient allowances for AMP8 relies on the presence of consistent and repeatable cost patterns within historical data. This consistency allows for a model to establish a stable and reliable relationship between costs and cost drivers. Sporadic or irregular spending patterns are more susceptible to volatility, which is then introduced into the data and therefore into the model. This hinders the model's ability to establish meaningful trends and make accurate predictions for AMP8. In this regard it is noted that Ofwat's principles one and five for PR24 base cost assessment are "*Data used in our base cost assessment approach is good quality"* and "*Robust econometric cost models".*[89]

123. In the dataset that Ofwat has used for modelling sludge quality enhancement,[90] expenditure occurs on an inconsistent basis over time and across companies. This feature means the relationship is unstable between Ofwat's selected bioresources base cost drivers and sludge quality

[88] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 15, SOC-2-0065.
[89] Ofwat, December 2024, PR24 FD: Expenditure allowances – base cost modelling decision appendix, SOC-2-0001.
[90] Ofwat, December 2024, Base costs wastewater model 3 – bioresources model code: PR24CA93, SOC-2-0046.

enhancement expenditure over time. This is reflected in the poor statistical performance of bioresources models in the FD, achieving adjusted R-squared scores (by which a model's ability to explain variations in costs is measured) of less than 0.2.[91] This means Ofwat's models are explaining less than 20 per cent of the variation in historical bioresources unit costs and are the worst performing models in all of Ofwat's econometric modelling suite. This highlights the poor explanatory power of the bioresources unit cost models at FD and the need for broader cross-checks on the answers generated.

124. Following the decision in the FD to include sludge quality enhancement within the scope of bioresources base expenditure, Ofwat stated "*The inclusion of sludge quality enhancement in the bioresources cost models, and the decision to set the catch-up efficiency challenge over the full sample period (2011-24), ensures (without doubt) that companies can deliver AAD upgrades with bioresources base expenditure allowances".*[92] Despite the firmness of Ofwat's assertion, 86% of recorded sludge quality enhancement occurs before 2016/17 (accruing from 50 of 130 historical data points used for modelling), with spend beyond this point being incremental in comparison. Reported spend is concentrated amongst three companies who report an 80% share.[93] Ofwat has reported 190 actual and forecast data entries within benchmarking, and for 98 data observations no sludge quality enhancement expenditure is reported. Cost models rely on established trends to quantify the relationships between costs and cost drivers. In the case of sludge quality enhancement spend, the lack of a consistent trend over time and across companies will skew the quantified relationship between cost and cost drivers.

125. The issues which project driven capital expenditure present for econometric benchmarking techniques is well-documented. In its 'RIIO-2 tools for cost assessment' consultation, Ofgem states that "*repex may be lumpy over time and so may not be consistent over a price control period. This can cause issues when using regression techniques, since atypical expenditures, or companies being at different stages in their investment cycles, may distort modelling results."*[94] Ofgem goes on to say that "*it raises the question of whether these activities should be included within the econometric benchmarking model".*[95]

126. The irregularity and lack of recent sludge quality investment recorded within the panel data skews the relationship between cost and cost drivers downwards. This means the models underestimate the true costs of investing in AAD. It is consequently not possible to identify a consistent trend between historical sludge quality enhancements and the cost drivers addressed by the model, and therefore models based on these data are not suitable for use in setting AMP8 allowances for investment in AAD. These models do not constitute a robust basis for determining AMP8 allowances for investment in sludge quality enhancement. Ofwat's conclusion the models can provide adequate allowances for AAD investment at AMP8 therefore contradicts principle five of its PR24 cost assessment principles.[96]

127. The historical period used for modelling in the FD extends back to 2011/12.[97] This omits periods prior to 2011/12 where Northumbrian Water[98] and Welsh Water received additional allowances for step-change transitions to AAD on the basis these were 'exceptional' capital maintenance items.[99]

[91] Ofwat, December 2024, PR24 FD: Expenditure allowances – base cost modelling decision appendix, page 78, SOC-2-0001.
[92] Ofwat, December 2024, SRN CAC Feeder Model Code: PR24CA19, SOC-2-0020.
[93] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 6, SOC-2-0065.
[94] Ofgem, June 2019, RIIO-2 tools for cost assessment, page 40, SOC-2-0047.
[95] Ofgem, June 2019, RIIO-2 tools for cost assessment, page 40, SOC-2-0047.
[96] See Figure 1 above
[97] Ofwat, April 2023, Econometric base cost models for PR24, page 14, SOC-2-0005.
[98] Bran Sands Advanced Anaerobic Digestion Facility, December 2009, Northumbrian Water - from Sludge Drying to Digestion, SOC-2-0021.
[99] Ofwat, 2004, Future water and sewerage charges 2005 -10 - Final determinations , page 174, SOC-2-0077.

Consequently, the modelling period fails to capture all the relevant AAD investments made across the sector.

128. Northumbrian Water delivered two AAD facilities via two design and build contracts, one at Bran Sands in 2007 and one at Howdon in 2010, These investments were worth more than £60m, equivalent to over £80m in 22/23 prices.[100] Welsh Water was also funded to deliver a £70m investment,[101] equivalent to £90m in 22/23 prices, comprised of two strategic AAD plants at Cardiff and Aran sites in 2011.[102] Ofwat holds Northumbrian Water's schemes as exemplary bioresources investments yet fails to account for the significant value of these investments excluded from the historical modelling period used to set base allowances.

129. Selecting 2011/12 as the start date for the modelling period presents a methodological limitation when considering the step-change investments that occurred shortly before the modelling period begins. This approach misrepresents the investment profiles of schemes initiated before 2011/12 but completed after the defined cutoff point. Given the front-loaded nature of investment expenditure, such schemes may appear artificially under-invested within the historical modelling data.

130. Northumbrian Water and Welsh Water were able to take significant steps in adopting AAD prior to the modelling period ahead of moving to more incremental investments from 2012 onwards. We have estimated FD bioresources allowances with and without sludge quality enhancement. This allows us to take the difference between the two scenarios whilst all other factors are held equal. This difference represents the additional modelled allowance arising from Ofwat's decision to include this expenditure within the scope of base costs at FD. We refer to this difference as the 'implicit allowance' for sludge quality enhancement. KPMG has estimated that the sector-wide implicit allowance for sludge quality investment for AMP8 is £152m before the application of frontier shift, the catch-up challenge and RPEs.[103]

131. This is a sector-wide total allowance for sludge quality enhancement investment (and before further efficiency challenges are applied), yet it is comparable in value to just the Northumbrian Water and Welsh Water investments highlighted above. United Utilities alone reported £148.2m[104] in sludge quality enhancement expenditure between 2011 and 2017. It is noted that Ofwat acknowledged our observation that companies received allowances for step-change AAD transitions prior to 2012 but provided no comment on how this has skewed modelled base allowances for sludge treatment.[105]

132. Even for investment occurring within the historical modelling period, Ofwat noted that historical AAD investment reporting has been inconsistent, with prior AAD upgrades being funded through both base and enhancement allowances, stating that *"historical AAD investment was included in the base cost models if the company reported it under base expenditure or growth expenditure. We understand through the PR24 query process that reporting of AAD expenditure is mixed."*[106] The uncertainty on the quality and accuracy of this expenditure contradicts principle one of Ofwat's principles of PR24 base cost assessment – *"Data used in our base cost assessment approach is*

[100] Adjusted using Office for National Statistics, CPIH INDEX 00: ALL ITEMS 2015=100, SOC-2-0048.
[101] Adjusted using Office for National Statistics, CPIH INDEX 00: ALL ITEMS 2015=100, SOC-2-0048.
[102] B. Oliver, 2011, Cardiff & Afan Advanced Digestion Plants, SOC-2-0049.
[103] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 9, SOC-2-0065.
[104] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 7, SOC-2-0065.
[105] Ofwat, December 2024, SRN CAC Feeder Model Code: PR24CA19, SOC-2-0020.
[106] Ofwat, December 2024, SRN CAC Feeder Model Code: PR24CA19, SOC-2-0020.

good quality". It is not correct to use this data to set allowances through econometric benchmarking.

Ofwat have wrongly asserted that AAD upgrades can be delivered with AMP8 base allowances following the inclusion of sludge quality enhancement within base

133. KPMG's analysis[107] has found that we receive £11.5m (before frontier shift, the catch-up challenge and RPEs) in additional AMP8 allowances following the inclusion of sludge quality enhancement within the scope of modelled base costs and the longer catch-up challenge period. It highlights that Ofwat made an error when it stated that the implicit allowance of £5.12m we estimated in our CAC "*materially underestimate[s] the implicit allowance"*.[108]

134. Ofwat has assumed that using the full modelling period to set the catch-up challenge "*ensures (without doubt) that companies can deliver AAD upgrades with bioresources base expenditure allowances*".[109] Ofwat's decision to use the catch-up challenge to try and remedy the lack of AAD funding provided by the base models risks distorting future benchmarking. There is an interaction between the timing of sludge quality enhancement and the period used to set the catch-up challenge as the modelled efficiency challenge is sensitive to the inclusion of short windows of atypical sludge quality investment.

135. In the FD, Ofwat increased the period used to calibrate the catch-up challenge from the last five years (2019/20 to 2023/24) to the full sample period (2011/12 to 2023/24). The longer period leads to a less stringent efficiency challenge than the shorter period (0.93 versus 0.86).[110] This is because the longer period captures AAD investment which accrued prior to 2019/20 (when the five-year catch-up period begins). AAD investment predominantly accrues early on within the historical modelling period where companies that adopted AAD were in the initial phases of their investment cycles. Consequently, spending is atypically high in these years due to the elevated capital intensity which is characteristic of the early stages of AAD investment.

136. All else held equal, this makes the earlier years in the modelling period appear more costly, which is then identified in the base models as inefficiency. When including these years within the catch-up period, the resulting catch-up challenge estimated becomes less stringent as the sector benchmark appears less efficient. Conversely, the recent years where AAD spend has not accrued more efficient, which will result in a more stringent catch-up challenge when using this period alone.

137. The move to the full historical period to set the catch-up challenge (from the five-year period) leads to large swings in company modelled efficiency scores as the modelled efficiency of companies who invested in sludge quality enhancement early on worsens. The stability of company efficiency scores over time has been used by Ofwat as a model goodness-of-fit test. This volatility in efficiency scores indicates that Ofwat's chosen cost drivers do not explain variation in sludge quality enhancement well. Altering the catch-up challenge does not constitute a solution to the limitations of the base models in funding AAD as it only partially offsets more fundamental modelling issues that may distort future benchmarking.

138. Table 10 below sets out KPMG analysis showing how our allowance varies when including or excluding sludge quality enhancement and using either the shorter or extended period to set the catch-up challenge.[111]

[107] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 9, SOC-2-0065.
[108] Ofwat, December 2024, SRN CAC Feeder Model Code: PR24CA19, SOC-2-0020.
[109] Ofwat, December 2024, SRN CAC Feeder Model Code: PR24CA19, SOC-2-0020.
[110] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 12, SOC-2-0065.
[111] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 12, SOC-2-0065.

Table 10: Implicit sludge quality allowance scenarios

Scenario	Scope of base costs	Catch-up period used	Modelled allowance, £m (before catch-up)	Upper quartile catch-up challenge	Modelled allowance, £m (after catch-up)
A	Includes sludge quality enhancement	Latest five years (2019/20 to 2023/24)	290.1	0.86	249.6
B	Includes sludge quality enhancement	Full sample period (2011/12 to 2023/24)		0.93	268.6
C	Excludes sludge quality enhancement	Latest five years (2019/20 to 2023/24)	278.5	0.89	248.1
D	Excludes sludge quality enhancement	Full sample period (2011/12 to 2023/24)		0.87	241.0

Source: KPMG analysis

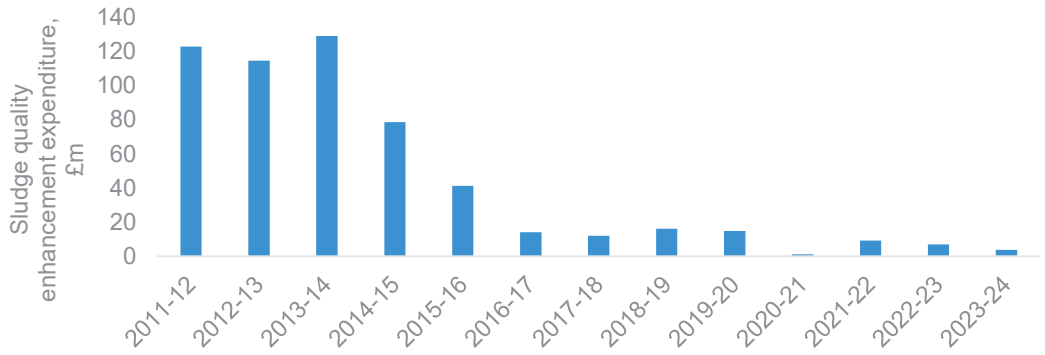
139. A simplistic approach to identifying the implicit allowance for sludge quality enhancement would be to compare Ofwat's approach in the FD (Scenario B, i.e., including sludge quality enhancement within scope of base models and using the full period to estimate catch-up) with its approach in the DD (Scenario C, i.e., excluding sludge quality enhancement from scope of base models and using a catch-up challenge based on the latest five year period). Using this comparison, we estimate a total impact of £20.5m.[112]

140. The positive impact on our allowance when comparing the FD and DD approach is largely driven by Ofwat's discretionary choice to change the catch-up challenge applied as opposed to relying on the underlying modelling. The implicit allowance varies depending on the choice of counterfactual. For example, when comparing Scenarios A and C, which hold the catch-up challenge constant at five years and only differ concerning the inclusion or exclusion of sludge quality enhancement, the resulting implicit allowance is only c.£1.5m. Estimating the implicit allowance by comparing scenarios with different catch-up periods therefore does not make a comparison on a level basis, particularly when atypical expenditure occurs disproportionately over time. We have used the implicit allowance of £11.5m[113] before catch-up is applied to re-estimate the net value of our claim (compare rows in the fourth column of Table 10).

141. The inadequacy of the implicit allowance and sensitivity of the catch-up challenge to the time period used is unsurprising when viewed in the context of the sludge quality enhancement costs reported within the modelling period, shown by Figure 12 below.

[112] Scenario B minus Scenario C in Table 10 - £268.6m minus £248.1m
[113] £290.1m minus £278.5m

Figure 12: Total reported annual sludge quality enhancement expenditure (£m, 2022 prices)[114]



Source: KPMG analysis
Note: 86% of total reported annual sludge quality enhancement expenditure occurred prior to 2016-17

142. Figure 12 illustrates the inconsistency of sludge quality enhancement included within the dataset used for modelling. Sludge quality enhancement is concentrated in the first five years of the sample period and is therefore only predominantly captured by the extended catch-up period. Ofwat has overlooked the fundamental limitations within the base bioresources models this creates. It is clear Ofwat has erred in its conclusion that sufficient expenditure for investment in this activity is included within AMP8 modelled allowances.

143. Regardless of the specific scenarios used to estimate our AMP8 implicit allowance, even the most optimistic approach which compares different catch-up efficiency periods results in an increase in our AMP8 allowance of £20.5m (less than 20% of our CAC requested amount). This demonstrates that Ofwat's statement that changes at Final Determination mean that AAD upgrades can now be delivered with base expenditure allowances *"without doubt"*[115] is patently not true.

In the FD, Ofwat allowed similar AAD investment by other companies falling outside the scope of modelled base allowances

144. Ofwat's assessment of our AAD CAC was inconsistent with its approach to Thames Water's analogous sludge treatment investment proposal, the Beckton Sludge Powered Generator replacement scheme (the **Beckton scheme**). The contradictory approach taken by Ofwat in accepting the Thames Water scheme through the large scheme gated process highlights the errors made by Ofwat during its assessment of our AAD CAC.

145. Ofwat accepted Thames Water's Beckton scheme despite acknowledging that it had concerns surrounding cost efficiency, noting that "*limited cost efficiency evidence has been provided, and the scheme has not been fully developed.*"[116] This appears to indicate that Ofwat chose to apply a more difficult standard in its assessment of our AAD CAC than for the Beckton scheme despite referring to them in terms that indicate equivalence (*"We have allowed four cost adjustment claims to companies"* [117]).

[114] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 6, SOC-2-0065.
[115] Ofwat, December 2024, SRN CAC Feeder Model Code: PR24CA19, SOC-2-0020.
[116] Ofwat, February 2025, PR24 FD Expenditure allowances, page 321, SOC-1-0006.
[117] Ofwat, February 2025, PR24 FD Expenditure allowances, page 81, SOC-1-0006.

146. The Beckton scheme is analogous to our AAD CAC across multiple dimensions, yet Ofwat has approved the Beckton Scheme to be taken forward through the gated process. Below we highlight the similarities between our CAC and Beckton Scheme across several features in Table 11.

Table 11: Comparison of Southern Water AAD CAC and Thames Water Beckton Sludge Powered Generator Gated Scheme

Feature	Southern Water CAC	Thames Water Gated Scheme
Bioresources treatment technology	AAD	AAD
Purpose of investment	Replaces ageing treatment assets	Replaces ageing treatment assets
Considered by Ofwat to be Base or Enhancement expenditure	Base	Base
AMP8 forecast cost (£m)	108	167

Note: Table demonstrating similarities between rejected Southern Water CAC and accepted Thames Water Gated Scheme

147. Despite the clear similarities between our AAD CAC and the Beckton scheme, Ofwat took very different positions when assessing the respective claims. Most notably, in relation to our AAD CAC Ofwat took the view that that modelled base cost allowances are sufficient to support a step change in sludge quality enhancement, whereas it stated that this is not the case when assessing the Beckton Scheme.

Estimating the value of our cost adjustment claim

148. Capital cost estimates for the proposed upgrades at Ashford and Ham Hill were derived by our Cost Intelligence Team (**CIT**), formed of professional cost estimators and data modellers. Our Engineering Team developed a concept design for the proposed upgrades which outlined major scope items. Direct cost estimates for these items were derived by CIT using cost information for key assets based on historical data. This data was captured from the delivery of real projects across the industry. We used optimisation modelling to determine the best solution based on cost, carbon data and physical constraints. The detailed optioneering, costing and benchmarking still stands and is set out within our original CAC.[118]

149. Our direct cost estimates have been refined to exclude costs that can be funded through existing funding channels within the PR24 framework. Cake storage[119] scope for each scheme was reallocated to WINEP enhancement funding following approval by the Environment Agency. We used market testing to challenge our cost estimates for Thermo Hydrolysis Plant (**THP**), a potential AAD solution, which resulted in downwards reductions to cost estimates. Operational costs have been excluded from the CAC as the new facilities will not be operational until AMP9.

[118] Southern Water, August 2024, SRN-DDR-016: Bioresources AAD Cost Adjustment Claim, SOC-2-0018.
[119] Cake storage in water treatment is how companies safely store treated sewage sludge in tanks or drying beds before it is transported and disposed.

Table 12: Direct cost estimates for Ashford and Ham Hill AAD upgrades including adjustments, £m

Costing Adjustments	Ashford AAD (£m)	Ham Hill AAD (£m)
Direct cost estimates	**31.9**	**61.6**
Cake Covering transferred to WINEP (Approved)	-6.6	-4.7
Adjustment of design & costing for THP	-2.2	-15.5
Move from Biomethane Upgrade to CHP	-	0.8
Growth element removed	-3.4	-6.7
Final direct cost	**19.8**	**35.6**
Total project costs (incl. indirect costs)	**40.3**	**72.5**
Total AMP8 investment in AAD	**112.8**	

150. Mott MacDonald conducted third party assurance and external benchmarking of our direct cost estimates. Mott MacDonald used direct cost data for alternative water sector sources held anonymously and applied it to the same scope of work as our Ashford and Ham Hill schemes. The assessment highlighted no significant differences.[120] Furthermore, Mott MacDonald undertook a separate benchmarking assessment of the THP solution for the AAD plants. The assessment concluded the benchmarking results for our supplier costs were well within the acceptable tolerance levels for both the Ashford and Ham Hill schemes,[121]

151. To validate the scope underpinning our costs, we compared our design to a newly commissioned AAD facility with similar capacity to the intended upgrade at Ham Hill. This sewage treatment centre is operated by another WaSC with longstanding experience with AAD processes. This highlighted no issues with our design and resulting costs. An itemised scope comparison between our Ham Hill design and this STC is provided in Appendix 7 of our CAC.[122] This document has been technically assured by Jacobs.

152. After accounting for the £11.5m implicit allowance in the FD for AAD, we estimate the net value of our claim is £101.3m.[123]

Required Remedy

153. The AAD upgrade at our sludge treatment centres will bring technological benefits, which will improve both our long-run efficiency and resilience of bioresources operations for our customers as we confront the risks arising from climate change.

154. To remedy the error identified, we request that our CAC for £101.3m is accepted, with our bioresources cost allowances adjusted accordingly. This adjustment will ensure that the technological change can be funded and is therefore achievable.

[120] Southern Water, August 2024, SRN-DDR-016: Bioresources AAD Cost Adjustment Claim, Direct capital costs benchmarking, SOC-2-0018.
[121] Southern Water, August 2024, SRN-DDR-016: Bioresources AAD Cost Adjustment Claim, Appendix 6: THP Benchmarking, SOC-2-0018.
[122] Southern Water, August 2024, SRN-DDR-016: Bioresources AAD Cost Adjustment Claim, SOC-2-0018.
[123] Net value of claim is equal to £112.8m minus £11.5m

155. The recovery of required efficient costs to allow for timely replacement of our sludge treatment technology also means promoting economic solutions. It does so by supporting investment in a more operationally efficient and environmentally friendly technology. This in line with Ofwat's secondary duty to contribute to the achievement of sustainable development.

156. This proposed remedy should be considered in parallel to the remedy requested in respect of Error 2 of Chapter 4: Treatment of Uncertainty Through Mechanisms, where we make the case for this investment to qualify for Direct Procurement for Customers (**DPC**). Overall, the AAD project needs a sufficient allowance and the route to using third party delivery is a viable approach that would encourage competition for the market. Further detail is included in that Chapter.

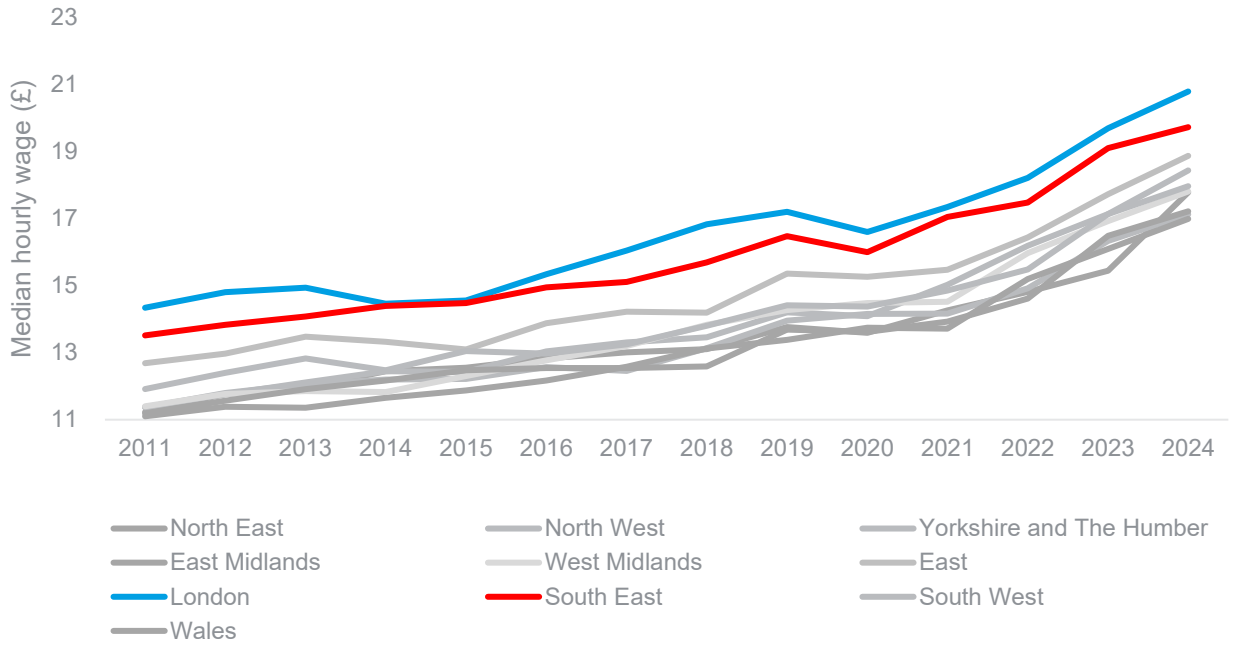
3.1.2. Error 4: Not accepting our cost adjustment claims related to increased regional labour costs

The Issue

157. Our location in the South East, particularly close to London, places us in a region with significantly higher wages than the national average. Data from the Office of National Statistics (**ONS**) shows clear evidence that manufacturing wages (Ofwat's benchmark for the water sector) in the South East are significantly above the national average. Across the 2011-2024 period, wages in the South East were 9%[124] higher than the national average. **Error! Reference source not found.** b elow shows the comparatively high wages in London and the South East of England compared to all other regions from the ONS's Annual Survey of Hours and Earnings (**ASHE**).[125]

[124] For basket of SIC codes relevant to the water sector
[125] Office for National Statistics, March 2024, Annual Survey of Hours and Earnings (ASHE), SOC-2-0022.

Figure 13: ASHE Regional hourly median wage for basket of Standard Industrial Classification codes, (£)



Note: London and the South-East have higher wage levels than the rest of the UK[126] The sectors included are Manufacturing (C), Water supply, sewerage, waste management and remediation activities (E), Construction (F), Information and Communication (J), Professional, Scientific and Technical activities (M) and Administrative and Support Services activities (N) Standard Industrial Classification (SIC) codes

158. The role of regional labour costs in driving expenditure is well recognised in the energy sectors. At RIIO-2, Ofgem applied a pre-modelling adjustment to capture differences in regional wages in electricity and gas distribution. Ofgem use a three-region approach, adjusting for London, the South East and elsewhere. Ofgem's approach therefore recognises the elevated labour costs utility companies operating in our region face.[127]

159. Disparities in regional wage levels were not accounted for in Ofwat's base cost models and fall outside of management control given our operations are naturally concentrated within the region of our infrastructure. Furthermore, as we are south of London, cheaper labour from the Midlands or East Anglia would need to travel through or around London to reach us, making it even harder to attract in lower cost labour. We therefore face a more difficult funding challenge within our base operations across both wholesale water and wastewater network plus, for which a CAC is appropriate.

[126] Southern Water, Error 4 - Regional Wages - Within model adjustment, worksheet "regional wage series", SOC-2-0069.
[127] Ofgem, June 2022, RIIO-ED2 Draft Determinations – Core Methodology Document, Appendix 5, SOC-2-0024.

Summary of previous representations

160. To account for the regional disparity in wage levels not being captured within base models, we submitted two CACs within the Water network plus and Wastewater network plus price controls as part of our Business Plan submission in October 2023. These CACs used an accounting method to estimate a net claim value of £21.5m and £66.4m in Wholesale water and Wastewater network plus respectively. Ofwat rejected these CACs, concluding that they both failed the "need for adjustment" and "cost efficiency" assessment gates.[128]

161. As part of our DD Response, we submitted updates to our CACs, with further econometric evidence corroborating the need and materiality of the requested adjustments to allowances. We included two pieces of analysis to evidence the need for adjustment. First, we used a pre-modelling adjustment in line with the approaches established by Ofgem within electricity and gas distribution price controls. Second, we used an econometric approach incorporating a real wage cost driver within base models. The pre-modelling adjustment yielded a £26m and £29m upwards adjustment in the wholesale water and wastewater network plus markets respectively.

162. After conducting its own analysis, Ofwat assessed that for both Water network plus, and Wastewater network plus there was no need for adjustment, having again concluded that both CACs failed the "need for adjustment" and "cost efficiency" assessment gates.

Our approach to estimating the impact of regional wages on base allowances

163. In our previous CACs in the Business Plan submission and DD Response, we have submitted three different types of analysis to assess the impact regional wage disparities has on our efficient level of base cost expenditure. We conducted this analysis for the wholesale water and wastewater network plus price controls.

a) **First approach: An accounting method** – this approach estimated our implicit labour cost allowance and then adjusted it upwards by the difference between our region's hourly labour cost and the industry average.[129] We used the ONS ASHE manufacturing wage data to calculate this. By this method we estimated a net claim value of £22m and £66m in the wholesale water and wastewater network plus price controls respectively.[130]

b) **Second approach: A within modelling adjustment** – we added an ASHE hourly wage driver into wholesale water and wastewater network plus base cost models to assess the impact this had on modelled base cost allowances. We developed an ASHE median hourly wage index based on a basket of relevant Standard Industrial Classification (**SIC**) codes relevant to the water sector.[131] The wage driver achieved statistical significance and a positive coefficient in water and wastewater base models.[132] We submitted this evidence within our DD Response CAC in August 2024. In our latest analysis, this approach results in

[128] Ofwat, December 2024, SRN CAC Feeder Model Code: PR24CA19, SOC-2-0020.
[129] We derived the implicit labour cost by multiplying our allowance by a labour cost share assumption and the proportion of labour sourced locally
[130] Southern Water, October 2023, SRN23 Regional Wages Cost Adjustment Claim, SOC-2-0023.
[131] Manufacturing (C), Water supply, sewerage, waste management and remediation activities (E), Construction (F), Information and Communication (J), Professional, Scientific and Technical activities (M) and Administrative and Support Services activities (N) Standard Industrial Classification (SIC) codes
[132] Statistical significance indicates whether an observed effect is due to a genuine relationship between costs and cost drivers. In this case, the statistical significance and positive coefficient of the wage driver in base models supports the conclusion that higher regional wage levels do drive increases in efficient base costs.

a £73m and £85m upwards adjustment to our wholesale water and wastewater network plus allowances, respectively.

c) **Third approach: A pre-modelling adjustment** – a pre-modelling wage adjustment normalises model input data before models are run. Wage disparities in observed costs are removed using a wage index which standardises regions with higher or lower wages around the UK average. This removes high and low labour costs from the input data. This frees the models of bias introduced by regional wage disparities unrecognised by base cost drivers at final determination. We applied this adjustment to historical labour costs using the same ASHE index developed for the within modelling adjustment. Once the models have been run with adjusted data, the resulting allowances must be re-adjusted to account for the actual wage levels faced. A pre-modelling adjustment for labour costs was employed by Ofgem in both the RIIO-ED2[133] and RIIO-GD2 price controls.[134] In the latest analysis undertaken by KPMG, this approach results in a £19.7m and £1.2m upwards adjustment to our wholesale water and wastewater network plus allowances, respectively.[135]

164. There are merits to each of the above approaches in estimating the impact of regional wage disparities on efficient base cost allowances. The "accounting method" is simple to understand and demonstrates the impact of this issue. The "pre-modelling" adjustment is established in regulatory precedent following Ofgem's application of this approach in the electricity distribution and gas distribution sectors. This approach requires assumptions to be made on the share of labour costs within base expenditure as well as the proportion of labour which is sourced locally in the region (assuming there is some scope to outsource certain activities to other regions with different wage levels). A "within modelling" adjustment is beneficial in this sense at it does not require these assumptions to be made. A "within modelling" adjustment therefore does not introduce noise through introducing assumptions where there is a degree of uncertainty.

165. In adopting three different approaches, we were able to confirm that the findings of the three approaches corroborated that Ofwat's FD models did not provide sufficient funding. This provides robust evidence on the need for a regional wage adjustment considering the individual merits of each approach.

166. We also developed a regional wage index using wage levels extracted from ASHE data for a subset of SIC codes of relevant industries to the water sector. This approach carries the advantage of being able to omit sectors with high wages such as the finance and insurance sectors which do not reflect typical wage levels within the water sector.[136]

167. When comparing regional wage levels, we must choose between assessing mean or median wages. There will be variation in the distribution of wages between each region, whereby some regions will have higher proportions of very high earners within their wage distribution. In these instances, the mean wage value will be skewed upwards.

168. The ONS states[137] that "*the median is the value below which 50% of jobs fall. It is ONS's preferred measure of average earnings as it is less affected by a relatively small number of very high earners and the skewed distribution of earnings. It therefore gives a better indication of typical pay than the mean.".* Our analysis is underpinned by median wages in recognition of the importance of using a wage index that is free from the distortions of high earners when estimating a wage adjustment to

[133] Ofgem, June 2022, RIIO-ED2 DD – Core Methodology Document, SOC-2-0024.
[134] Ofgem, February 2021, RIIO-2 Final Determinations – GD Sector Annex (REVISED), SOC-2-0026.
[135] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 21, SOC-2-0065.
[136] Office for National Statistics, October 2024, Annual estimates of paid hours worked and earnings for UK employees by sex, and full-time and part-time., SOC-2-0025.
[137] ONS, Earnings and hours worked, UK region by industry by two-digit SIC: ASHE Table 5, SOC-2-0080.

base allowances. This ensures we compare the regional wage levels seen across companies on a like for like basis.[138]

Pre-modelling adjustment findings – replicating Ofgem's approach (KPMG analysis)

169. At RIIO-ED2 and GD2, Ofgem made an adjustment for regional wages through a pre-modelling adjustment which adjusts for London, South East and everywhere else.[139][140] This involves using observed wage levels for each region to remove the effects of high and low wages within the input cost data via an adjustment before models are run (i.e., the pre-modelling adjustment).

170. KPMG has conducted a pre-modelling adjustment[141] closely following Ofgem's approach for the wholesale water and wastewater price controls. However, KPMG use median hourly wage levels from ASHE as opposed to mean wages. Median wages are less affected by high-earners within the wage distribution and are more reflective of typical wage levels.

171. To make the pre-modelling adjustment, KPMG has first estimated the proportion of labour costs within base expenditure. KPMG use Ofwat's PR19 assumption that labour costs form 38.6% of wholesale costs.[142] This assumption is based on an assured methodology developed by Ofwat and therefore KPMG consider this is a robust assumption to make[143].

172. Secondly, KPMG make an assumption to reflect that we have some scope to outsource our operations to other regions where wages are lower. In PR19, Ofwat assumed that between 70% and 100% of labour was sourced locally.[144] Within this range KPMG use 88% as a conservative assumption. This assumption means that 12% of our labour costs could be relocated to lower-wage regions through efficient management control, which is a stretching assumption in our experience. At RIIO-ED2 Ofgem also applied a local assumption of 88% for costs,[145] excluding support activities.

173. To adjust historical company labour costs, KPMG developed an index based on the median regional wage series we derived from a basket of SIC codes relevant to the water sector within the ASHE data.[146] KPMG used this ASHE index to adjust labour costs for each company, whereby the labour costs for companies with wage levels above or below the national average had their costs adjusted accordingly. This standardises wages around the national average and strips the input data of any disparities in regional wage levels which are unobserved by Ofwat's cost drivers. In line with Ofgem's methodology, KPMG standardise the index so 'everywhere' else is equal to one to make adjustments easier to interpret. An index for each company was developed by mapping the three-region wage index to the regions each company operates within according to a weighted average of customers based on Ofwat data.[147] Based on this approach, the index used for Southern Water is 1.15.

174. Once models are re-run with the adjusted labour costs, the models produce efficient AMP8 allowance estimates which are free of bias introduced by differences in regional wage levels. The

[138] Ofwat has erroneously used mean wages within its analysis. We will set out details of this error later in this Chapter.
[139] Ofgem, June 2022, RIIO-ED2 DD – Core Methodology Document, SOC-2-0024.
[140] Ofgem, February 2021, RIIO-2 FD – GD Sector Annex (REVISED), SOC-2-0026.
[141] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 17, SOC-2-0065.
[142] Europe Economics, December 2019, Real Price Effects and Frontier Shift – Final Assessment and Response to Company Representations, SOC-2-0027.
[143] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 18, SOC-2-0065.
[144] CEPA, March 2018, PR19 econometric benchmarking models, page 121, SOC-2-0050.
[145] Ofgem, June 2022, RIIO-ED2 Draft Determinations – Core Methodology Document, SOC-2-0024.
[146] Manufacturing (C), Water supply, sewerage, waste management and remediation activities (E), Construction (F), Information and Communication (J), Professional, Scientific and Technical activities (M) and Administrative and Support Services activities (N) Standard Industrial Classification (SIC) codes
[147] Southern Water, Error 4 - Regional Wages - Within model adjustment, worksheet "Mapping_waste" and "Mapping_water", SOC-2-0069.

labour cost adjustments must then be reversed within the modelled allowances to reflect the true labour costs each company faces. To adjust the forecast AMP8 allowances KPMG applied the 13-year historical average of the index for each company (see Figure 13 above) to the labour cost share within base allowances. This approach captures the long-term trend in wage disparities between regions. After re-adjusting the AMP8 allowances, KPMG estimate a £19.7m adjustment in our water and a £1.2m adjustment in wastewater allowances, totalling at a £20.9m upwards adjustment. [148]

175. This provides strong evidence on the need for an adjustment to our base allowances to reflect regional wage discrepancies. Base cost model performance also remains strong under KPMG's pre-modelling adjustment methodology.[149]

176. We have conducted further econometric analysis to assess whether our findings align with KPMG's pre-modelling adjustment results. We did this via a "within modelling" adjustment where we included our regional wage series as a cost driver within base cost models as an additional cost driver. This allowed us to further interrogate the extent to which regional wage levels drive disparities in base expenditure. This approach provides further econometric evidence on the need for a regional wage adjustment to our base allowances.

Within model adjustment findings - Including the median wage index as a driver in water base models

177. Using the median wage index driver consistently demonstrated a positive impact on base expenditure across all top-down and bottom-up water models, with the sign and magnitude of coefficients on other drivers remaining stable. The explanatory power of the models remained consistently high, with R-squared scores generally above 0.9. The ASHE wage driver also achieved high statistical significance, particularly in Wholesale Water and Treated Water Distribution models suggesting a strong positive relationship exists between regional wage levels and water base expenditure.[150]

a) **Water Resources Plus:** The driver achieved significance at the 10 percent level in two out of six models. This means we can be 90 percent confident that the observed relationship is not due to chance variation. The coefficient was always positive, indicating a positive relationship between higher wages and base expenditure which is consistent with what might intuitively be expected. Model performance in the RESET test improved considerably.

b) **Treated Water Distribution**: The driver achieved significance at the 1 percent level in all six models, demonstrating strong statistical significance whilst the coefficient remained positive. The explanatory power of the models remained very high, with an average R-squared of 0.96.

c) **Wholesale Water**: The driver achieved significance at the 5 percent level in all twelve models, indicating strong statistical significance. The coefficient remained positive, indicating a strong positive relationship. The explanatory power remained strong, with R-squared scores of 0.96.

[148] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 21, SOC-2-0065.
[149] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 20, SOC-2-0065.
[150] Southern Water, Error 4 - Regional Wages - Within model adjustment, worksheet "water model results", SOC-2-0069.

178. With the inclusion of the ASHE wage index driver our triangulated base cost allowance would increase by £73m.[151] This corroborates the findings of KPMG's pre-modelling adjustment which identified the need for an upwards regional wage adjustment in the wholesale water price control.

Within model adjustment findings - Including the median wage index as a driver in wastewater base models

179. The median wage index driver retained a positive coefficient across all wastewater models, which is consistent with what might intuitively be expected, and also aligned with the case that higher wage levels drive base expenditure upwards. The coefficients on the other drivers also remained stable demonstrating there were no unexpected interactions when the wage driver was included.

180. The explanatory power of the models remained consistently high, with R-squared scores generally above 0.9. The wage driver also achieved high statistical significance within Sewage Treatment Models, demonstrating a strong positive relationship between regional wage levels and wastewater base expenditure. [152]

a) **Sewage Treatment:** The driver achieved high statistical significance at the 5% level in both models, with a positive coefficient. The R-squared of the models remained high.

b) **Wastewater Network Plus**: The driver achieved statistical significance at the 10% level in one of two models. The driver holds a positive coefficient in all models, and the explanatory power of the models remains high, achieving an R-squared of 0.95.

181. Following the inclusion of the ASHE wage index driver our triangulated base cost allowance increases by £85m in wastewater network plus.[153] This is aligned with the findings of KPMG's pre-modelling adjustment which yielded an upwards adjustment in the wastewater network plus price control.

Within model adjustment conclusion

182. The within model adjustment provides an intuitive approach to estimating the impact of regional wages on efficient base cost allowances. Unlike the pre-modelling adjustment, it is not reliant on the need to make assumptions on the proportion of labour costs within base costs which introduce a degree of uncertainty into the analysis. The findings of our within model adjustment and KPMG's pre-modelling adjustment are aligned. Both approaches provide econometric evidence for the need for an upwards adjustment to our base cost allowances in both the wholesale water and wastewater network plus price controls.

183. The performance of the ASHE wage driver within base cost models provides conclusive evidence that there is variation in base expenditure which is not explained by FD base model specifications. The ASHE wage driver has a positive coefficient which reflects what might intuitively be expected given that higher wages within in a region will drive up base costs, all else held equal. The econometric evidence on the need for an upwards adjustment holds across both the wholesale water and wastewater network plus price controls.

[151] Southern Water, Error 4 - Regional Wages - Within model adjustment, worksheet "water final allowances", SOC-2-0069.
[152] Southern Water, Error 4 - Regional Wages - Within model adjustment, "wastewater model results", SOC-2-0069.
[153] Southern Water, Error 4 - Regional Wages - Within model adjustment, worksheet "wastewater final allowances", SOC-2-0069.

184. Given this is not captured within base model specifications in the FD, there is a strong needs case for adjustment to ensure our operations in the South East are suitably funded. Furthermore, the uplifts estimated also demonstrate that the issue is material.

Ofwat's decision to reject our cost adjustment claim

185. Despite this compelling evidence being included within our regional wage CACs, Ofwat rejected our CACs in the FD, for which it gave the following reasons:[154]

a) Ofwat conducted an independent analysis in its assessment whereby it applied a pre-modelling adjustment to labour input costs. Ofwat used a mean wage index derived from ASHE. Ofwat stated this approach to be more "*influenced by the skew of the wage distribution*"[155] compared to when median wage measures are used. The wage distribution describes the spread of wage levels across the workforce, and a skewed wage distribution means the distribution of wages leans more towards either high or low wage levels. Right-skewed wage distributions are common and refer to the situation where most workers earn wages below the mean wage. This occurs when a small group of high earners pull the mean upwards. Mean wage levels therefore do not reflect typical pay when the distribution is skewed by high earners. This detail is pertinent to our claim, given our region's wages are skewed by high wage levels in London and surrounding areas. Despite this, Ofwat cited our use of median wages as a reason for rejecting our CACs.[156]

b) This methodological error was further compounded by Ofwat's approach to deriving a wage index using Standard Occupational Codes (**SOC**) spanning several sectors. Ofwat did not include details on the specific composition of the index it used in response to our CACs. When asked, Ofwat shared further details of the approach it took to estimating a wage index. Ofwat's approach included sectors such as financial services and insurance, which are clearly not representative of the costs we face.

c) This approach contrasts with the targeted Standard Industrial Classification (SIC) approach we have adopted in developing our wage index. Our approach focuses on wage levels within the SIC codes most reflective of the water supply sector and therefore omits sectors with wage levels which are not representative of those our company faces.

186. Below we highlight the series of errors Ofwat has made in its assessment of our regional wages CACs, alongside supporting evidence to substantiate our claims.

Ofwat wrongly claimed population density cost drivers within base cost models capture regional disparities in wage levels

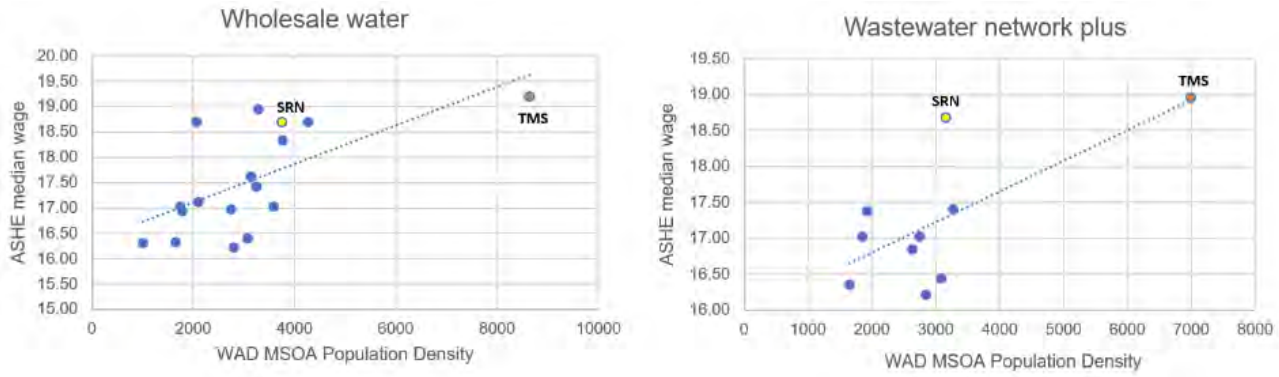
187. Ofwat has asserted that population density drivers included within base models capture regional disparities in wage levels. Ofwat stated "*regional wage differentials are already sufficiently captured by the inclusion of population density in the base cost econometric models. As we argued in PR19, this is likely to be because the correlation between density and regional wages is high at between 0.65 and 0.70 using the weighted regional wage*".[157]

[154] Ofwat, December 2024, SRN CAC Feeder Model Code: PR24CA19, SOC-2-0020.
[155] Ofwat, December 2024, SRN CAC Feeder Model Code: PR24CA19, SOC-2-0020.
[156] Ofwat, December 2024, SRN CAC Feeder Model Code: PR24CA19, SOC-2-0020.
[157] Ofwat, December 2024, SRN CAC Feeder Model Code: PR24CA19, SOC-2-0020.

188. The correlation between wage levels and population density is a spurious correlation largely driven by London. When plotting the ASHE median wage against population density for each company there appears to be a trend whereby wage levels rise with increasing density. This is illustrated by Figure 14. This does not mean there is a causal link under which regions with higher population density consistently have higher wage levels. Both wage levels and population density are driven by many factors. We are an example of this correlation not holding in reality. This is because we have disproportionately high labour costs when normalised by population density compared to our peers. We face high wage levels in the South East whilst our population density is aligned with the sector average.

189. When removing Thames Water (located within the London region where wage levels are high), the positive correlation weakens significantly. The sensitivity of the correlation between wage levels and population density to the removal of the London region provides evidence the observed correlation is random. This supports our conclusion that regional wage disparities are not captured by population density drivers within base cost models. Our CAC[158] included strong evidence of our position as an outlier, demonstrating that whilst we face similar wage levels to Thames Water, our density is between two and three and a half times lower than its region. Ofwat acknowledged this evidence within its assessment but failed to provide further comment or challenge to its relevance.

Figure 14: Correlation between population density and regional wage levels by company



Note: our position above the dotted line indicates we face a higher wage level than the wage level implied by the correlation between wage levels and population density in the sector. For example, in wastewater network plus the dotted line implies we should face a wage level below £17.50 per hour, yet the actual hourly rate for our business is above £18.50 per hour.

190. Further to this, as shown by Table 13 below, when excluding Thames Water (and therefore the London region), the correlation between the ASHE wage driver included within our analysis and Ofwat's density drivers falls significantly to between 0.11 to 0.27. This demonstrates that the correlation is artificially driven by the inclusion of the London region within models as opposed to an enduring relationship between population density and wage levels. Affinity Water and South East Water are other companies operating within areas in the South East with average density and high wage levels

[158] Southern Water, August 2024, SRN-DDR-013: Regional Wages - Cost Adjustment Claim, SOC-2-0075.

Table 13: Correlations between logged ASHE wage driver and population density drivers

Cost Driver Correlations with the ASHE wage driver	Including Thames Water	Excluding Thames Water
Density	0.516	0.268
WAD from MSOA	0.571	0.228
WAD from LAD MSOA	0.505	0.112

191. In the FD, in Ofwat's wholesale water base model specifications, the correlations between the complexity and average pumping head drivers is roughly 0.3. This is comparable to the correlations between wage and density observed when excluding Thames Water (as presented above). This highlights the inconsistency between Ofwat's decision making in the assessment of our CACs and the modelling decisions they have made elsewhere in cost assessment framework.

Ofwat replicated Affinity Water's flawed methodology in the assessment of our initial cost adjustment claims submitted with our Business Plan

192. In the DD, whilst Ofwat stated it had conducted independent analysis, it also claimed that "*replicating Affinity Water's pre-modelling regional wage adjustment approach does not support the need for a regional wage cost adjustment".*[159] Due to several methodological limitations we highlight below, this analysis does not apply to our company and does not provide an evidential basis for rejecting our claim.

193. Affinity Water conducted their analysis using weekly wages recorded within ASHE data, as opposed to hourly wages which more accurately capture the price of labour. Affinity Water provided the reasoning that "*Ofwat, CEPA and Ofgem have used hourly wages to evaluate regional wage effects. However, most of our employees are salaried rather than paid hourly and we concluded that weekly wages better reflect employment arrangements in water companies*."[160] This implies that Affinity Water omitted contractor wages from their analysis which will make up a significant portion of labour costs within base expenditure.

194. Ofwat's adoption of Affinity Water's approach was inconsistent with prior precedent. Affinity Water's methodology is flawed, in that hourly wages better represent the true price of labour compared to weekly wages. This is because hourly wages are not distorted by the number of hours worked. For example, regions with lower average hours worked per week might appear to have lower labour costs when measured by weekly wages, even if their hourly wages are comparable to regions with higher average hours worked. While Affinity Water may argue that weekly wages are simpler to use, this approach overlooks the fact that all employees, including salaried workers, have an implicit hourly wage rate that should be considered.

195. We are concerned that the influence of Affinity Water's approach has caused Ofwat to falter in its application of the CAC framework for our separate claim. In the FD, in response to our CAC, Ofwat did not make explicit reference to Affinity Water's methodology, but it is unclear how its analysis was updated and how Southern Water-specific information was factored into Ofwat's assessment

[159] Ofwat, December 2024, SRN CAC Feeder Model Code: PR24CA19, SOC-2-0020.
[160] Affinity Water, AFW42 - PR24 Cost Adjustment Claims, page 8, SOC-2-0028.

of our CAC. It appears, however, that at least Ofwat's initial assessment was based on a flawed methodology, having been influenced by a company that was facing very different circumstances and was affected by high population density.

196. This in turn has established an artificially high evidential threshold for our latest CACs to exceed. It also raises concerns regarding the procedures Ofwat took in assessing our CACs, given that it cited another company's flawed methodology as cause for rejection rather than responding to the evidence we provided.

Ofwat erroneously used mean wages within its analysis as opposed to median wages

197. The Office for National Statistics (ONS) states[161] "*the median is the value below which 50% of jobs fall. It is ONS's preferred measure of average earnings as it is less affected by a relatively small number of very high earners and the skewed distribution of earnings. It therefore gives a better indication of typical pay than the mean."* Our analysis is underpinned by median wages in recognition of the importance of using a wage index that is free from the distortions of high earners when estimating a wage adjustment to base allowances.

198. Ofwat's analysis is underpinned by mean wages as opposed to median wages. Ofwat itself acknowledged that mean wage levels are "*influenced by the skew of the wage distribution*".[162] Given our proximity to London, mean wage levels in the South East are skewed upwards. The median is therefore a better measure of the central tendency of wages in a region as it is less influenced by extreme values.

199. Table 14 below shows the size of the differences between the mean and the median in regions in England and Wales. The median-mean ratio shows the proportion of lower and higher earners: a higher number indicates the presence of a larger number of higher earners (which pulls the mean upwards compared with the median), and a lower number indicates the presence of a larger number of lower earners. These figures indicated that in London, the Southeast, and East, there are likely more higher earners in the region pulling the mean wage upwards compared to other regions, and that this is the case in these regions more than it is in the other regions. The data also indicates that the South East has a higher average wage than the other regions (excluding London), even when using the median which is less impacted by skew. This implies that there is a structural difference in wages for these regions compared to the rest of the UK.

Table 14: Regional hourly wage differences, ranked by median-mean ratio

	Median (£)	Mean (£)	Median-Mean Ratio
Wales	16.13	19.36	1.20
Yorkshire and The Humber	15.98	19.7	1.23
South West	16.43	20.29	1.23
East Midlands	16.03	19.8	1.24
North West	16.38	20.38	1.24
North East	15.33	19.1	1.25

[161] Office for National Statistics, March 2024, Annual Survey of Hours and Earnings (ASHE), SOC-2-0022.
[162] Ofwat, December 2024, SRN CAC Feeder Model Code: PR24CA19, SOC-2-0020.

Northern Ireland	15.32	19.1	1.25
West Midlands	16	20.03	1.25
South East	18.4	23.44	1.27
East	17.58	22.62	1.29
London	20.27	26.74	1.32

Source: ONS 2024 ASHE dataset: Table 8

200. Ofwat's use of mean wages, which are subject to varying levels of skew arising from the presence of high earners, is a cause of error in the FD. Using a driver based on median wages, as we have, mitigates for the skew in the wage distribution, as acknowledged by Ofwat in its assessment of our cost adjustment claim.[163] This is reflected in the fact that our findings are aligned with the adjustments made by Ofgem within our region within the RIIO-ED2 and RIIO-GD2 price controls.[164]

201. Ofwat's advisor, CEPA, has previously stated that the mean wage will better reflect the average wages of companies "*except in the presence of outliers*".[165] In this instance, the wage levels in our region are clearly skewed upwards due to our proximity to London meaning that our region is an outlier, which supports the use of median wage measures. Additionally, the positive skew in the mean wage index developed by Ofwat is exacerbated by its method of estimating an index based on a basket of occupations spanning several industries, not all of which are relevant to the water sector. We cover this point in more detail below.

Ofwat has failed to consider the value of using a wage index based on relevant industry codes

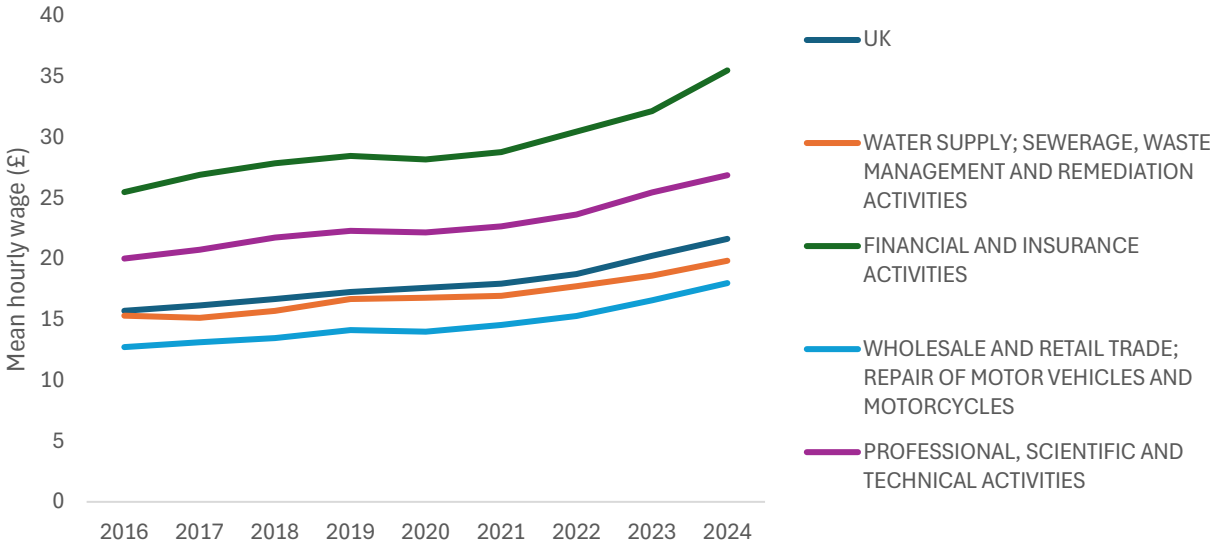
202. The composition of the ASHE index, in terms of both occupations and industry codes, is critical to ensuring it accurately reflects the water sector. Wage levels for any given occupation reporting code will vary significantly across industries.

203. Ofwat has used SOC codes to define their index. This means they have defined their index based on occupations which cut across industries. Ofwat claim using occupational codes allows them to capture the jobs within a typical water company and therefore measure differences in wage levels. They have not controlled for industries (or SIC codes) when deriving a wage index for the water sector. This is in contrast with the publicly available ASHE data produced by the ONS, whereby the regional breakdown tables provide wage data either by occupation or industry.

204. Ofwat's index included industries which are not reflective of the water sector. Industries such as 'Insurance' and 'Finance' traditionally have higher wage levels than the water sector, even for a given occupation. An engineer at Google will not be paid the same as an engineer in the water industry. The same is true for an accountant at a financial institution or an accountant in the water industry. The differences in wage levels across SIC codes is shown by Figure 15 below.

[163] Ofwat, December 2024, SRN CAC Feeder Model Code: PR24CA19, SOC-2-0020.
[164] Ofgem, February 2021, RIIO-2 FD – GD Sector Annex (REVISED), SOC-2-0026.
[165] CEPA, March 2017, Regional wage adjustment – The Northern Ireland Utility Regulator (UR), page 7, SOC-2-0029.

Figure 15: Mean wage comparison across sample of SIC codes, £



Source: Office for National Statistics, October 2024, Annual estimates of paid hours worked and earnings for UK employees by sex, and full-time and part-time., SOC-2-0025.

205. In response to our initial CAC at DD, Ofwat acknowledged, "*The estimated regional wage differences using ONS ASHE wage data can vary significantly depending on the choice of wage measure, which questions the reliability of the regional wage differentials calculated using ONS ASHE data*".[166] The specific subset of ASHE data used will impact the observed disparity in regional wages. We disagree with Ofwat's conclusion that this brings into question the reliability of ASHE data.

206. This underscores the necessity of developing a wage index relevant to the water industry as we have done. This contrasts with Ofwat's approach of basing its analysis on an overly broad index that spans multiple industries that do not reflect the water sector.

207. Furthermore, Ofwat has cited as a key reason for rejecting our claim the fact that *"The company uses 1-digit SOC code weightings, while Ofwat relies on 2-digit SOC codes for the weighted index (i.e., more disaggregated job categories). We consider that this better reflects job categories that are relevant to a typical water company."*[167] The supporting material we provided did not mention SOC codes, and we were transparent in our methodological decision to derive a wage index based on SIC codes (including a breakdown of the SIC codes used). Ofwat's justification for using SOC codes to determine a wage index is unclear, especially when a more representative wage index for the water sector can be derived using SIC codes.

208. Ofwat has not fully responded to our approach and benefits in terms of explaining how regional wage disparities affect efficient base cost levels. This has led to invalid reasoning for rejecting our CAC related to SOC codes. It has failed to acknowledge our use of SIC codes and thereby has not provided adequate justification for its decision.

209. Our wage driver, grounded in relevant industry codes, is further validated by its robust performance when included as a driver in base models. This demonstrates its effectiveness in capturing the

[166] Ofwat, December 2024, SRN CAC Feeder Model Code: PR24CA19, SOC-2-0020.
[167] Ofwat, December 2024, SRN CAC Feeder Model Code: PR24CA19, SOC-2-0020.

relationship between regional wage level variations and efficient base allowances. In contrast, Ofwat's approach has led to confounding results because its index is overly broad in industry coverage. It fails to measure the regional wage disparities within the water sector.

Ofwat wrongly claim our econometrics evidence is insignificant

210. Ofwat's dismissal of our econometric evidence as insignificant is unfounded. Our analysis employed robust methodologies, both in pre-modelling adjustments and within-model adjustments. Both found strong statistical evidence of the need for adjustment.

211. Closely following Ofgem's established approach, we conducted a pre-modelling adjustment using ASHE median hourly wage data. Model performance remains strong following the pre-modelling adjustment with R-squared values improving slightly in some cases. Furthermore, other cost drivers remain highly significant, and their coefficients remain stable.

212. Contrary to Ofwat's assertion, the inclusion of a regional wage variable within our base cost models further validated the need for a regional wage adjustment. This approach, free from assumptions about labour cost proportions, showed a positive and statistically significant relationship between regional wage levels and base expenditure in both water and wastewater models. The explanatory power of all models remained consistently high when including an ASHE wage driver. The coefficient on the density cost drivers remained stable when including a wage driver. This demonstrates that the ASHE wage driver is explaining variation in efficient base costs that the density drivers are not capturing. This is evidence that Ofwat was wrong when they claimed that density drivers would account for regional wage disparities.

213. The alignment of both the pre-modelling and within-model adjustments provides compelling econometric evidence for upward adjustments to base cost allowances in both wholesale water and wastewater network plus price controls. The consistent positive coefficient of the ASHE wage driver, coupled with its statistical significance and robust performance of base models, directly contradicts Ofwat's claim. This evidence demonstrates that there is strong statistical support for this adjustment. This evidence underscores the materiality of the issue and the need for appropriate adjustments to ensure adequate funding for operations, particularly in higher-wage regions like the South East.

We have demonstrated through multiple approaches that there is a need for an adjustment

214. We face additional labour costs due to the geographic region we operate in. We have undertaken multiple analytical approaches to quantify the additional cost. We have showed that regional wage disparities are not captured through Ofwat's base models.

215. Despite it being clear that this is an issue arising for firms in the South East of England, there is no agreed regulatory approach to quantify and correct for this issue. It is for this reason that we have produced three distinct approaches – with each bringing differing strengths and weaknesses. We are aware that other companies that also operate in the South East have produced different analyses during the PR24 process and previously. The presence of these different approaches only acts to strengthen the need to make an adjustment.

216. There is regulatory precedent from Ofgem for quantifying this effect through a pre-modelling adjustment. However, including regional labour costs as a driver within the model appears to be the approach most in line with how Ofwat chooses elsewhere to identify the efficient cost level. This approach relies less on assumptions than does the pre-modelling approach. Also, by including the new driver in the model, we can explicitly see the relationship with population density and confirm that this regional labour cost driver is significant regardless. We therefore believe that the

appropriate remedy should be determined by this approach. However, using any of the alternative approaches would constitute a viable alternative option.

Required Remedy

217. Water and sewerage services are delivered by regional companies, with dedicated pipe and infrastructure networks in each supply area. It is important that the regulatory framework recognises regional differences across the sector which impact efficient expenditure levels. This will ensure benchmarking is undertaken on a level playing field and that companies do not go underfunded due to exogenous factors outside of their control.

218. The recovery of efficient costs enables water companies to finance and properly carry out their statutory functions. This ensures that the models will most effectively determine the efficient level of expenditure for each company. This will provide confidence that all companies can fund the base costs needed to deliver a strong level of customer service. This will in turn have a positive impact on service quality, which is in the interest of customers. As climate risk increases, it is critical that our operations are fully funded so we can provide our customers with the quality-of-service provision they deserve. In adjusting for regional factors, this means customers can be more confident in the reliability and quality of their water service, even in the face of challenging environmental conditions.

219. To remedy the error identified, we request that our cost adjustment claim CACs are accepted. We have demonstrated there is a material impact through two robust statistically significant approaches; either through a pre-modelling adjustment, similar to Ofgem's approach or through adding a variable directly to the econometric models. Based on the within modelling approach,[168] we request that our water and wastewater base allowances receive £73m and £85m adjustments, respectively.

3.1.3. Error 5: Not accepting our cost adjustment claim related to higher costs incurred by wastewater companies operating in coastal areas

The issue

220. Southern Water has the largest coastal population of all WaSCs both in absolute and in percentage terms. Figure 16 below shows that Southern Water's proportion of coastal population, at 41%, is significantly above the sector average of 19%.

[168] Southern Water, Error 4 - Regional Wages - Within model adjustment, worksheet "wastewater model results" and "water model results", SOC-2-0069.

Figure 16: Coastal population by WaSC (000s) (left) and percentage coastal population by WaSC (right)

Note: The proportion of Southern Water's population that reside on the coast is significantly greater than then industry average.

Source: ONS data on coastal towns and cities[169]

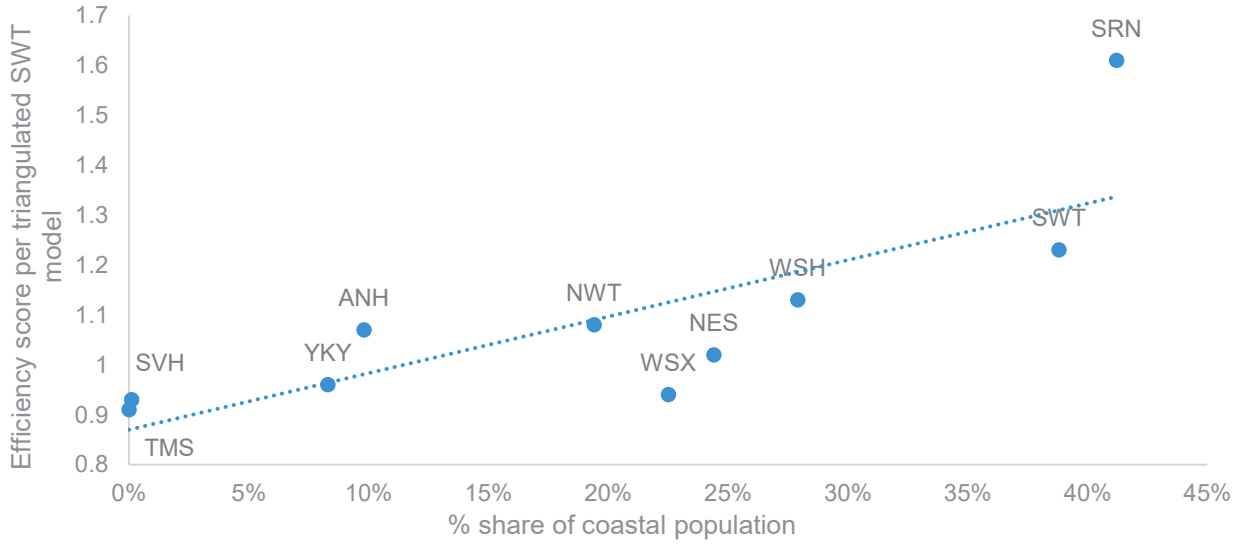
221. Coastal environments exert unique cost pressures on wastewater treatment. These cost pressures, which Ofwat has accepted from an engineering basis,[170] are not captured in Ofwat's econometric models. Omitting the coastal driver in base econometric models implies that our efficient treatment costs that relate to coastal cost pressures are not funded. We therefore face an undue funding challenge within our base operations across wastewater treatment.

222. Ofwat's sewage treatment models systematically disadvantage companies that serve large coastal populations compared to companies with no or fewer coastal areas to serve. Consequently, efficiency scores in wastewater treatment models that do not capture coastal effects erroneously show us to be less efficient.

223. The scatterplot below shows that there is a strong positive correlation between the efficiency scores and the percentage share of coastal population served by each company. The two companies with zero coastal population (Severn Trent and Thames Water) rank as the most efficient companies, with scores at or below 1. Yorkshire Water, which has the third smallest coastal population also is among the top performing companies in the models where coastal effects are not accounted for.

[169] Southern Water, July 2023, Cost Adjustment Claim - The implications of coastal population on wastewater treatment costs, SOC-2-0076.
[170] Ofwat, December 2024, SRN CAC Feeder Model Code: PR24CA19, SOC-2-0020.

Figure 17: Correlation between % share of coastal population and efficiency scores based on Ofwat's triangulated sewage treatment models[171]



Note: Scatterplot showing Southern Water is efficient when using models that do not use a coastal variable.

Table 15: Efficiency scores from wastewater treatment models without coastal variable[172]

	Efficiency score			Ranking		
	SWT1	SWT2	Triangulated	SWT1	SWT2	Triangulated
TMS	0.82	1.00	0.91	1	5	1
SVH	0.91	0.94	0.93	2	2	2
WSX	0.92	0.97	0.94	3	4	3
YKY	0.97	0.94	0.96	5	1	4
NES	0.95	1.09	1.02	4	7	5
ANH	1.17	0.97	1.07	8	3	6
NWT	1.12	1.04	1.08	7	6	7
WSH	1.06	1.19	1.13	6	8	8
SWB	1.27	1.19	1.23	9	9	9
SRN	1.75	1.47	1.61	10	10	10

Note: Table showing Southern Water ranks last in terms of efficiency in models that do not use a coastal variable.

Summary of previous representations

224. To account for coastal cost pressures, as part of the consultation process related to the base cost models, we proposed a new variable "*the proportion of 'coastal' population in a company areas*" to be included in Ofwat's PR24 wastewater treatment models. Ofwat's response in the April 2023 consultation 'Econometric base cost models for PR24', was that "*the variable may be capturing a*

[171] Analysis based on Ofwat, December 2024, Base costs wastewater model 3 Network Plus Model: PR24CA08, SOC-2-0051.
[172] Analysis based on Ofwat, December 2024, Base costs wastewater model 3 Network Plus Model: PR24CA08, SOC-2-0051.

Southern Water specific impact, rather than an overall industry-wide impact of operating in coastal areas"[173] and it did not include this variable in its base cost models.

225. We instead submitted a cost adjustment claim for £65.5m in Summer 2024 to account for the additional non-symmetrical costs faced due to us operating in coastal areas.[174] This claim was not accepted by Ofwat in the DD, with Ofwat considering that it failed both its 'Need for Adjustment' and 'Cost Efficiency' assessment gates. We subsequently submitted further evidence to corroborate our claim, both through our formal DD Response and in a supplementary submission in October 2024. In the FD, Ofwat again rejected the claim, concluding that it again failed the same assessment gates.

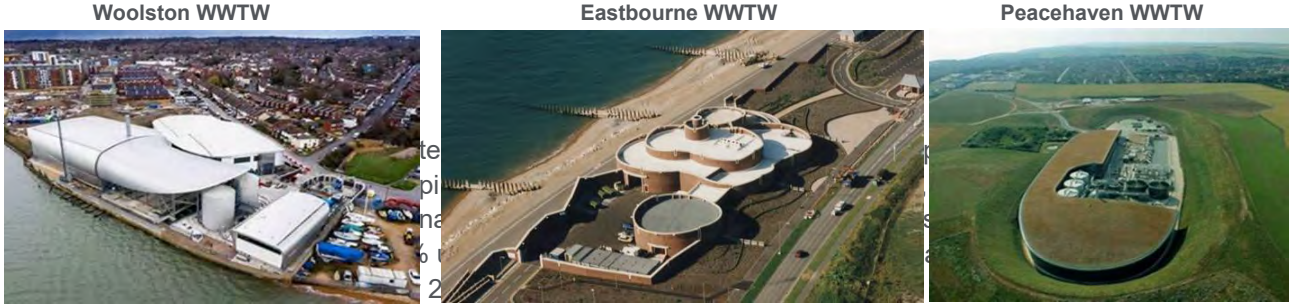
Coastal wastewater treatment work sites bring additional costs

226. Serving coastal population has unique challenges, which present specific cost pressures to wastewater treatment. These include: space constraints and planning restrictions; stricter Ultraviolet (**UV**) and Total Nitrogen consents; enhanced corrosion due to salinity; maintenance of sea outfall infrastructure; high load variability due to summer tourism; and stricter spill frequency constraints on coastal discharges. Whilst each cost driver may individually not be significant, the overall cost pressure of all these factors combined driven by proximity to the coast is material. We summarise below the specific engineering factors and associated cost pressures, further supporting evidence for which is set out in detail in our cost adjustment claim.[175]

Space and Planning Constraints

227. Traditionally coastal treatment works only had preliminary or primary treatment before being discharged to sea. In the 1990s, secondary treatment was required before discharge, which required much more space. All coastal sites are severely impacted by space and planning constraints. By their very nature, all coastal sites are limited to only one direction for potential growth. Planning restrictions on coastal land near urban centres are acute and often require atypical treatment works built underground or on a small footprint which incur significant additional chemical, energy and maintenance costs. Examples of this include Woolston (which is a very constrained site with a small footprint in an urban area requiring full odour control), Eastbourne (built completely underground due to planning restrictions and land availability) and Peacehaven (which, due to lack of suitable sites, had to be built 11km downstream from Brighton within the South Downs National Park with significant planning constraints requiring treatment processes to be enclosed underground).

Figure 18; Woolston, Eastbourne and Peacehaven Wastewater treatment work sites



[173] Ofwat, April 2023, Econometric base cost models for PR24, page 46, SOC-2-0005.
[174] Southern Water, August 2024, SRB-DDR-015: Coastal Population Cost Adjustment Claim, SOC-2-0030.
[175] Southern Water, August 2024, SRB-DDR-015: Coastal Population Cost Adjustment Claim, page 6-14, SOC-2-0030.

*Stricter Ultraviolet (**UV**) and Total Nitrogen Consents*

228. Ultraviolet (**UV**) and Nitrate are drivers of cost associated with effluent quality[176]. UV and Total Nitrogen consents are much stricter for coastal discharge, with operational outages of UV treatment limited to a maximum of four hours before consent failure. This level of operational resilience requires a higher degree of maintenance, energy, telemetry and monitoring, and out-of-hours support to ensure treatment works do not fail compliance compared with UV with inland sites. Our large wastewater treatment works with UV consent requirements have a unit cost of 47% above the average cost to operate non-UV works[177]. Sites with Total Nitrogen consents have a 21% higher unit cost to operate than non-Total N consented sites[178]. Whilst Ofwat's models do include a complexity driver, this is limited to ammonia consents only, and these additional complexities are not captured.

Enhanced Corrosion due to salinity

229. Enhanced corrosion from saline water and salt spray drives higher maintenance costs than comparable inland sites. These costs relate to higher specification valves and mechanical parts to cope with the corrosive environment, more frequent replacement of corroded assets and painting rusting structures

230. Saline water contains higher levels of sulphate than non-saline water, leading to higher risk of hydrogen sulphide creation during wastewater treatment. In a poorly ventilated space, this will result in rapid corrosion of not only mechanical, electrical and ICA equipment, but also concrete. To combat this, higher grade materials with better corrosion resistance have to be used, and enhanced ventilation and odour control is needed. Given local planning limits, this enhanced ventilation and odour control requires chemical intensive air scrubbers to avoid local air quality issues.

231. Coastal works also require increased chemical dosing to reduce the production of hydrogen sulphide. This is dosed at pumping stations and the inlet works to reduce the corrosive impact of hydrogen sulphide on the works caused by saline intrusion.

Maintenance of sea outfall infrastructure

232. Treatment works that discharge to seawater tend to have multiple and longer piped outfalls compared to inland works, which can discharge to an inland river. These outfalls incur higher maintenance costs including offshore navigation maintenance requirements. These sites, which unlike inland sites do not benefit from a gravity outfall, require pumping and backup pumps including power supply arrangements to support the outfalls.

High load variability due to summer tourism

233. Many coastal areas experience extreme summer peak loads due to tourism. Treatment works must be sized based on peak load (structure and treatment asset capacity). Ofwat's models use total load as a cost driver. However, this variable does not capture the effect of needing to be capable of handling peaks: for two sites with identical total annual load, the one that has higher peak would have to be of a larger capacity, with higher maintenance and operation costs both at peak and off-peak periods (during which time the smaller load is unavoidably treated with an over-sized works).

[176] Ammonia consents, which is a similar driver of cost are captured within Ofwat's PR24 models for inland waters through the complexity bands. This is unlike Total Nitrogen consents and UV treatment for coastal sites which are not considered within the econometric models.
[177] Southern Water, Error 5 - Coastal driver, worksheet "UV and TN", SOC-2-0070.
[178] Southern Water, Error 5 - Coastal driver, worksheet "UV and TN", SOC-2-0070.

Stricter spill frequency constraints on coastal discharge

234. Sites that discharge to seawaters have stricter spill frequency constraints due to shellfish and bathing water requirements. As a result, more storm tank, storm screening and storm pumping capacity is required with additional pumping to store and then treat the extra flow, resulting in additional maintenance costs over time.

235. As part of our updated CAC submitted after the DD, we submitted significant engineering evidence to demonstrate how each of these individual issues leads to additional costs.[179] At our FD Ofwat concluded that, *"from an engineering perspective, that there may be reasons why operating in coastal areas drive higher company costs."*[180]

The unit cost for our coastal sites is 43% higher than our inland sites

236. In the DD, Ofwat responded to our CAC by saying that our claim lacked information to show that a coastal premium actually exists and that it is material. In our DD Response, we provided internal costs showing that unit costs to operate coastal sites are indeed higher than inland sites. We demonstrate the premium for coastal works below through this unit cost analysis. However, whilst this helps to confirm the issue, this analysis does not account for economies of scale and therefore the resulting overall coastal premium calculated by the unit cost understates the impact on our network.

237. To quantify the additional cost pressures associated with coastal treatment works, we have utilised the data for large wastewater treatment works from APR Table 7B. The unit cost analysis aims to understand the variation in costs between our inland and coastal treatment works. We averaged four years of data from 2020-21 to 2023-24 and used total costs (in 22/23 prices) for each site against load (kg BOD5 per day) to obtain a unit cost (£/load) for each site.

238. The wastewater treatment sites have been defined as either coastal or inland sites according to a specific engineering characteristic. A coastal site is defined as a treatment works which discharges directly to the sea or saline marine harbour. An inland site is defined as a site which discharges elsewhere.

239. Our analysis suggest that coastal sites have a higher unit cost of [redacted] er kg BOD5, whilst inland treatment works have lower unit costs of [redacted] per kg BOD5. The unit cost analysis results demonstrate that our coastal sites have a significantly higher cost to operate, with on average 43% higher unit costs compared to inland works.

240. Our total cost for coastal works is £191m over the AMP (2022/23 prices). Given that the unit cost of operating coastal sites is 43% higher than the unit cost of inland sites, the equivalent cost if the coastal sites were to be operated inland is £134m. This equates to an additional £57m premium for operation in a coastal environment (see Table 16).

[179] Southern Water, August 2024, SRB-DDR-015: Coastal Population Cost Adjustment Claim, page 6-14, SOC-2-0030.
[180] Ofwat, December 2024, SRN CAC Feeder Model Code: PR24CA19, SOC-2-0020.

Table 16: Additional unit costs incurred by Southern (2020/21 - 2023/24)

		Unit cost (£/kg BOD)	Total costs over AMP (£m)
Inland sites		310	
Coastal sites		442	
Coastal/Inland	(a)	43%	
Coastal sites operating costs	(b)		191
Coastal site cost if operated inland	(c)= b / (1 + (a))		134
Coastal premium through unit cost method	**(d) = (b) - (c)**		**57**

Source: Southern Water analysis based on Annual Performance Review submissions (APR table 7B)[181]
Note: All costs are in 2022/23 prices

241. The unit cost of wastewater treatment work sites is impacted significantly by economies of scale (for more detail, see Error 1 above (in particular Figure 3 and Figure 4), which shows how unit costs are impacted by size).

242. Table **17** shows that Southern Water's coastal wastewater treatment sites are on average approximately double the size of inland sites. Given this size differential, all else being equal we would expect the sites with the larger load (i.e. coastal sites) to have lower unit costs than the sites with smaller loads (i.e. inland sites). This economies of scale factor cannot be captured within the unit cost analysis that we present above – which is ultimately comparing sites of very different sizes. Therefore, the bottom-up estimates of the coastal premium from the unit cost analysis data presented above in Table 16 are likely to underestimate of the true cost differential.

Table 17: Load for Southern Water wastewater treatment work sites (2020/21 - 2023/24)

	Total Load (BOD5)	Number of Sites	Load per site (BOD5/site)
All sites	995,313	44	22,621
Coastal sites	615,152	21	29,293
Inland sites	380,161	23	16,529

Source: Southern Water analysis

Our econometric evidence calculates our overall coastal cost premium of £125.6m

243. We have set out above the engineering rationale and bottom-up evidence on the coastal effects on wastewater treatment costs. To understand the full cost impact of Southern Water's coastal sites, we have undertaken econometric analysis which accounts for economies of scale and other factors and is therefore a superior method for estimating the overall coastal premium and to calculate the

[181] Southern Water, Error 5 - Coastal driver, worksheet "premium", SOC-2-0070.

required remedy.

244. As discussed, there are multiple factors that uniquely exert cost pressures on wastewater treatment in coastal areas. These factors could potentially be modelled more directly where data is available. We recognise that individually, each factor in isolation has some impact but only through a driver that captures all the effects is the magnitude sufficient to be statistically significant in Ofwat's small sample models.

245. We proposed a variable that encapsulates all factors together using exogenous data from an independent, trusted source. To provide econometric evidence for our cost claim we obtained data on coastal population by town and city from the ONS.[182] This allowed us to construct a variable that measures the proportion of coastal population within a company service area:

% coastal population in company i=(coastal population in company i)/(total population in company i)

246. The evidence suggests that collectively, through our proposed coastal variable, the factors above exert a perceptible, significant and logical influence on wastewater treatment costs.

247. Table 18 compares Ofwat's sewage treatment models in the PR24 FD and econometric results when the coastal population is included as an explanatory variable in these models. Results show that the models with coastal population as a driver meet all Ofwat's desirable statistical properties as defined by its model robustness tests.[183]

i) The coefficients of the coastal population driver is consistent with prior expectations of sign and magnitude and is highly statistically significant in all models.
ii) The R-squared improves with the introduction of the coastal variable to SWT models, moving from 0.83 for SWT1 and 0.89 for SWT2 to 0.89 and 0.91, respectively.
iii) The models with coastal population have improved (lower) range of efficiency scores, as compared with the models without coastal population as a driver.
iv) The impact on the other coefficients in the model is minimal, except for that of load, which significantly increases. The new coefficient estimate is similar to the coefficient estimate of other scale drivers in other water and wastewater models.

Table 18: Modelling output: Ofwat's Sewage treatment models against models with coastal population as a cost driver

	Without coastline variable		With coastline variable	
Full variable name	**SWT1**	**SWT2**	**SWT1**	**SWT2**
ln (load)	0.706***	0.815***	0.987***	0.961***
% of load treated in bands 1-3	0.025		0.034***	
% load with ammonia<=3mg/l	0.006***	0.006***	0.005***	0.006***
Coastal population			0.0141***	0.0101***
ln (weighted average treatment size)		-0.232***		-0.191***
Constant	-4.211***	-3.268***	-8.070***	-5.700***
N	130	130	130	130

[182] Southern Water, Coastal variable derivation, SOC-2-0082. Ofwat, December 2024, SRN CAC Feeder Model Code: PR24CA19, SOC-2-0020.

[183] Ofwat, December 2024, PR24 FD: Expenditure allowances – base cost modelling decision appendix, page 61, SOC-2-0001

	Without coastline variable		With coastline variable	
Full variable name	**SWT1**	**SWT2**	**SWT1**	**SWT2**
R_squared	0.830	0.890	0.890	0.913
RESET_P_value	0.211	0.786	0.000	0.889
Range of efficiency scores	0.93	0.53	0.49	0.25

Source: Southern Water analysis[184]

248. The econometric evidence suggests that Ofwat's sewage treatment models do not adequately account for coastal population.[185] Given Ofwat's decision not to include a coastal population variable, the inclusion of a coastal population CAC would address this, allowing Ofwat to set a more credible and effective efficiency benchmark.

249. Accounting for coastal population is intuitively appropriate, addresses a factor that is beyond management control, and is based on exogenous data from the ONS – a recognised independent source. The proposed approach satisfies all Ofwat's model selection criteria as follows:

a) High quality data

b) Engineering rationale

c) Exogenous cost driver

d) Estimated coefficient is statistically significant

e) Estimated coefficient has a stable, plausible magnitude and correct sign

f) Robust cost model

250. The inclusion of a coastal driver in sewage treatment models results in an increase in Southern Water's base cost allowance for the wastewater network plus price control by £125.6m.[186]

Ofwat has erroneously rejected our findings

251. Following our various submissions through the PR24 process, Ofwat *"conclude, from an engineering perspective, that there may be reasons why operating in coastal areas drive higher company costs".*[187] Despite recognising this, Ofwat ultimately rejected the cost adjustment claim as it did not consider the economic evidence as to our higher costs and the efficiency of the proposed adjustment to be sufficiently compelling.[188]

a) Regarding the top-down econometric evidence submitted to Ofwat, in the DD Ofwat argued that it was inappropriate to use the coastal population variable proposed as an explanatory variable as it did not have a direct link to a specific cost driver. In the FD, Ofwat did not

[184] Southern Water, Error 5 - Coastal driver, worksheet "wastewater model outputs", SOC-2-0070.
[185] We also tested the impact of including the coastal population variable within the Wastewater network plus models but it was not statistically significant. The results of these tests are included in our analysis (Southern Water, Error 5 - Coastal driver, worksheet "wastewater model outputs", SOC-2-007)
[186] Southern Water, Error 5 - Coastal driver, worksheet "final allowances", SOC-2-0070.
[187] Ofwat, December 2024, SRN CAC Feeder Model Code: PR24CA19, SOC-2-0020.
[188] Ofwat, December 2024, SRN CAC Feeder Model Code: PR24CA19, tab SRN_CAC6, SOC-2-0020.

respond directly to the new evidence that we provided and so we assume its rationale for not accepting the econometric evidence remains unchanged.[189]

b) Regarding the bottom-up unit cost evidence presented to Ofwat, Ofwat conducted its own unit cost analysis across the sector and concluded that it was inconclusive whether coastal wastewater treatment works bring higher costs than inland works.

252. Ofwat in its base econometric models uses explanatory variables that combine multiple cost drivers. For example, the "density" driver included in base models is a 'proxy' for three different effects: economies of scale, urbanity and sparsity. Similarly, Ofgem in its totex econometric models uses explanatory variables that do not have a direct link to costs. For example, a time trend included[190] in the Ofgem totex models captures multiple factors that impact all companies and increase, or decrease, year on year. These factors call into question Ofwat's view that a coastal variable was inappropriate because it does not have a direct link to a specific cost driver.

Methodological errors in Ofwat's unit costs findings

253. Ofwat's unit cost findings contrast our own due to a series of methodological errors which invalidate the results of their analysis and have led them to reject our claim.

254. Ofwat's analysis is based on a single year of data only whereas our analysis is based on four years of data that is available through APR reporting. By only including a limited data set, there is more risk of Ofwat's analysis being impacted by in-year site-specific issues which do not reflect wider long-term costs. We know that this is the case for some of our sites and we would expect the same issues to arise with other companies' data in this year. For example, there are two sites for which data is only available for two out of the four years (Lidsey and Uckfield) - we have included both in our analysis for the years they are available. Larger sample sizes provide more reliable results and are less likely to be influenced by results of a single year. We know, for example, that the increased rainfall experienced in 2023/24 (which was 35% higher than experienced in an average year) led to a short-term increase in costs for some of our inland sites that is less apparent over a longer period.[191]

255. Ofwat's definition of a coastal site is based on a crude definition of the distance to coast – not accounting for specific factors at the site which mean that it incurs the higher coastal related costs. We classify coastal sites as those which discharge directly to the sea or a marine harbour. These sites incur the higher costs of space constraints or double pumping; stricter Ultraviolet (UV) and Total Nitrogen consents; enhanced corrosion due to salinity; maintenance of sea outfall infrastructure; high load variability due to summer tourism; and stricter spill frequency constraints due to shellfish or bathing waters. For example, Ofwat's approach classified Chichester as an inland site, whereas we include Chichester as a coastal site given that it discharges into a marine harbour and has all the characteristics of a coastal location. It is a special area of conservation with marine components and is a shellfish water protected area with strict permits requiring both Total Nitrogen removal and UV treatment.

[189] Whilst Ofwat set out further reasons originally for not including the variable in the base models, it has not included any further reasons in response to our cost adjustment claim.

[190] Ofgem, June 2022, RIIO-ED2 Draft Determinations – Core Methodology Document, SOC-2-0024.

[191] A significant cause of the higher unit costs for inland sites in 2023/24 was the high groundwater affecting the operations at Fullerton and Chickenhall. This increased pumping costs and to a lesser extent chemical costs. At Fullerton the Flow to Full Treatment (FFT) is 453 l/s, in 2023/24 the FFT was increased to over 500 l/s to reduce discharge to storm tanks or the environment. This has a knock-on effect of increased inter stage pumping at the plastic media feed pumping station & Deep Bed sand filter feed pumping station. This all leads to increased site costs.

256. Conversely, we classify all sites which discharge to a river estuary as inland sites as they are less significantly impacted by the coastal cost drivers. This differs from Ofwat's classification of coastal sites which inconsistently excludes some sites which discharge to a river estuary (Northfleet, Portswood and Whitewall Creek) and includes others (Gravesend, Motney Hill and Sittingbourne) simply because they are within an arbitrary distance to the coast.

257. We have replicated Ofwat's analysis using the sector-wide 2023-24 APR data at the company level for the entire sector to complement our longer-term company-specific analysis for Southern. This has been done after correcting for those of our sites that we know were mis-defined by Ofwat. Table 19 shows the unit cost for each company in the industry for coastal and inland sites.

Table 19: Replicating Ofwat's unit cost of inland and coastal sites by company, 2023/24

	Inland	Coastal
	Unit cost total	Unit cost total
	£/kg BOD5	£/kg BOD5
ANH	241	322
NES	294	239
SRN	281	271
SVH	242	-
SWB	442	487
TMS	157	-
UUW	201	523
WSH	227	158
WSX	356	251
YKY	274	283
Industry average (simple average)	**271**	**317**
Industry average (weighted average)	**215**	**304**
Premium simple average	**17%**	
Premium weighted average	**41%**	

Source: Southern Water analysis[192]

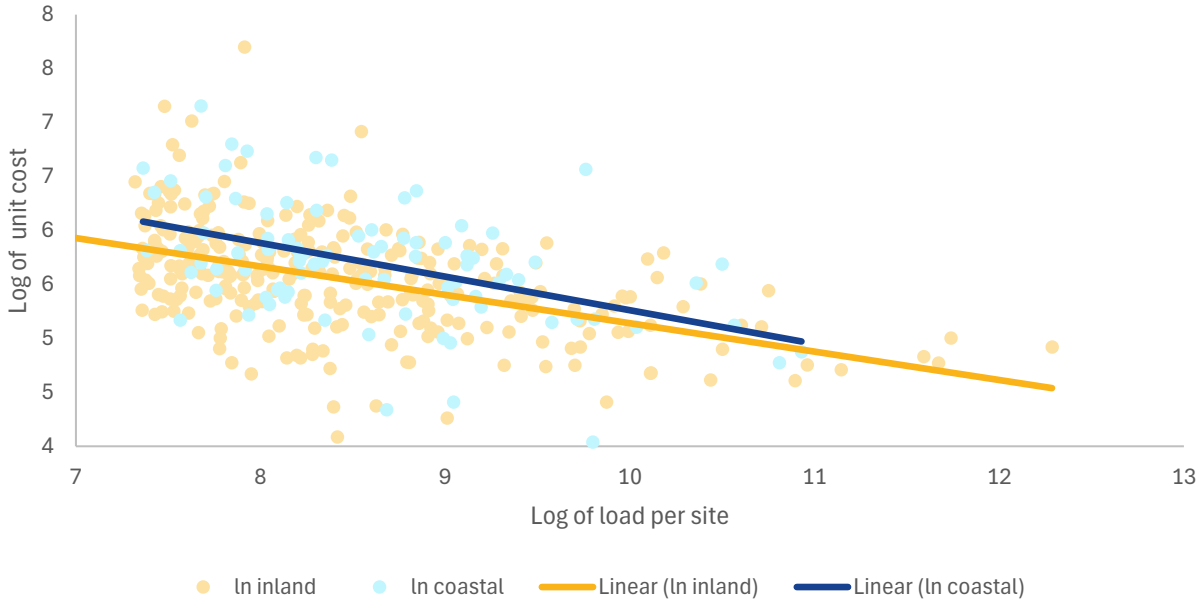
258. The results suggest that on average, the unit cost of a coastal site is higher than the unit cost of an inland site. We find that the weighted average unit cost is higher for coastal sites than inland ones by 41%. We conclude that even when following Ofwat's data and methodology (subject to reclassifying our sites as described above) there is a substantial difference in the costs to operate coastal sites compared to inland sites.

[192] Southern Water, Error 5 - Sector wide unit costs, worksheet "Summary", SOC-2-0071.

259. Ofwat in its response to our CAC reported only partially on its findings. Ofwat indicated that its analysis *"is inconclusive on whether unit costs for coastal STWs are generally higher than inland STW."*[193] In fact, that analysis showed a 41% cost difference at the industry-wide level, which we believe is certainly conclusive.

260. We also further analysed the sector data for each large treatment works reported in the APR data for the years 2020/21-2023/24. The data showed that sites were affected by economies of scale with the larger sites having the lowest unit cost. This conceals the true impact of the coastal premium for Southern Water which has coastal wastewater treatment sites double the size of inland sites as shown in Table 17 above. The scatterplot in Figure 19 and best fit lines demonstrate the relationship between the log of unit cost and log of load per site. For all sizes of treatment works, coastal sites are more expensive on average than inland sites.

Figure 19: Scatterplot to show the relationship between unit cost and load per site for all coastal and inland sites across sector (2020/21 – 2023/24, log values)



Source: Southern Water analysis[194]

261. Table 20 shows the premium for coastal sites compared to inland sites from the two best fit lines in the scatterplot. At low loads the coastal sites cost 70 £/kg BOD5 more than inland sites. The differential at larger loads is 10 £/kg BOD5.

[193] Ofwat, December 2024, SRN CAC Feeder Model Code: PR24CA19, tab SRN_CAC6, SOC-2-0020.
[194] Southern Water, Error 5 - Sector wide unit costs, worksheet "Collated", SOC-2-0071.

Table 20: Difference in unit cost for different sized coastal and inland sites

		In unit cost		Unit cost (£ / kg BOD5)		
In load	Load	Coastal	Inland	Coastal	Inland	Coastal premium
8	**2,981**	5.88	5.67	359	289	70
9	**8,103**	5.57	5.40	263	222	41
10	**22,026**	5.26	5.14	193	171	22
11	**59,874**	4.95	4.88	141	131	10

Source: Southern Water analysis[195]

262. When Ofwat presented its own unit cost analysis in response to our CAC, it did not account for the different sizes of sites within a company and the impact that economies of scale had on the unit cost. We can see in Table 19 that according to Ofwat's simple analysis there were four companies that had higher costs for inland sites in 2023/24 (Southern Water, Welsh Water, Wessex Water and Northumbrian Water). Ofwat used this finding for describing its analysis as inconclusive.

263. However, for all these four companies, the reason for this unexpected finding is due to economies of scale and the comparison between sites of different sizes. When coastal sites are compared to inland sites of the same size, they are nearly always more expensive. Table 21 below shows the unit costs for coastal and inland sites for these four specific companies at different bands. We can see that apart from Northumbrian sites within band 6 where the costs are slightly higher for inland sites, in all other cases the unit costs for coastal sites are higher than the equivalent inland site. Companies, most notably Welsh and Wessex, do not have large inland sites. This has the effect of increasing the average unit cost for inland sites compared to larger coastal sites under Ofwat's assumption that all sites are equivalent. For example, Wessex has inland sites at only band 6 with a unit cost of £232. This compares to a higher unit cost of £287 for band 6 coastal sites but an average unit cost of £175 driven by the lower unit costs of large coastal sites.

195 Southern Water, Error 5 - Sector wide unit costs, worksheet "Collated", SOC-2-0071.

Table 21: Unit cost of inland and coastal sites by company, 2023/24

	Band of site	Coastal	Inland
		Unit cost total	Unit cost total
		£/kg BOD5	£/kg BOD5
NES	6	339	344
	7	221	
	8		
	9	225	214
SRN	6	406	335
	7	237	93
	8	170	131
WSH	6	287	232
	7	265	
	8	72	
	9	76	
WSX	6	404	365
	7	421	314
	9	134	

Source: Southern Water analysis[196]
Note: Information has only been included for bands where the company has at least one site. The band numbers refer to banding used as part of Ofwat's Cost Assessment Working Groups when considering economies of scale variables for the wastewater econometric models

- Band 6 relates to works that treat wastewater in areas with between 25,000 and 125,000 population
- Band 7 relates to works that treat wastewater in areas with between 125,000 and 250,000 population
- Band 8 relates to works that treat wastewater in areas with between 250,000 and 500,000 population
- Band 9 relates to works that treat wastewater in areas with between 500,000 and 1,000,000 population

264. Ofwat did not report on the industry-wide average unit cost premium of 41% on the basis that it *"conduct[ed] our analysis at the company level to avoid biasing the results due to the efficiency performance of companies with a large number of STWs or high/low number of coastal sites."*[197] This approach is not in line with how Ofwat typically looks to benchmark and would have been open to Ofwat to adopt methods to weight the industry-wide analysis to account for any of these specific concerns. Moreover, we have shown in Table 21 how the company-level analysis presented by Ofwat is impacted by the size of sites being compared. Once these are accounted for, the premium for coastal sites is clear.

265. It is unfortunate that Ofwat's summary of the results of its unit cost analysis, provided in response to our CAC, appears to be incomplete and at odds with the most important part of those results (i.e. the sector-wide premium of 41%). We only identified this following a query process.

266. When Ofwat's analysis is corrected for the above errors, the sector-wide results suggest that on average the unit costs for coastal sites are higher than those for inland sites. This is consistent

[196] Southern Water, Error 5 - Sector wide unit costs, worksheet "Unit cost by company & band", SOC-2-0071.
[197] Ofwat, December 2024, SRN CAC Feeder Model Code: PR24CA19, tab SRN_CAC6, SOC-2-0020.

with what we find at the company level once we compare sites of a similar size. This is consistent with what might intuitively be expected given the engineering evidence that we presented and Ofwat accepted.

Decision to accept CAC needs to be done on a case-by-case basis

267. Ofwat provided a further reason for rejecting our CAC, namely that our allocated allowances pre-frontier shift and RPEs are higher than our requested costs for wastewater, and that this eliminates the need case. This is inconsistent with how Ofwat determines expenditure allowances and the process for developing base model outputs and separate cost adjustment claims.

268. Ofwat's decision not to accept the CAC on this basis is also inconsistent with how Ofwat set allowances for other companies in the FD. Eight companies out of seventeen have received higher than requested base costs pre-RPE and frontier shift. All these eight companies have received higher cost allowance through Ofwat's application of the sector-wide CACs. Moreover, Bristol Water has received company-specific adjustment through its Canal & River Trust CAC in the water resources control. Despite receiving this CAC, Bristol Water's pre-frontier shift and RPE allowance is still higher than the company's requested costs for water resources. In those cases, it appears that Ofwat did not consider that the overall base cost allowance eliminated the need for a CAC, contrary to its approach in our case.

269. Ofwat's decision to reject our coastal population CAC on the basis that the wastewater base models give enough allowance implies that Ofwat considers the current wastewater model outcomes to be efficient for Southern. In reality, as shown by the efficiency scores in Figure 17 above, Southern is an outlier with a triangulated efficiency score of 1.61 and the least efficient company according to the current specification of the wastewater models. However, when the coastal population variable is included, Southern's efficiency score improves significantly for both SWT models as shown in Table 22: 23below and the triangulated efficiency score is now 1.26.

270. When the coastal variable is included in the model, the efficiency range reduces significantly from 0.71 to 0.37. Ofwat's efficiency score distribution test clearly explains that *"A large range of efficiency scores could indicate the presence of issues in the underlying model, such as the presence of omitted variables*".[198] This demonstrates that the current model specification for Sewage Treatment Work is not giving the optimum outcome and improvements can be made by including the coastal variable – the variable currently omitted by Ofwat in its models

[198] Ofwat, December 2024, PR24 FD: Expenditure allowances – base cost modelling decision appendix, page 61, SOC-2-0001.

Table 22: 23 Efficiency scores by company, with and without coastal variable

	PR24 FD			With coastal variable		
	SWT1	SWT2	Triangulated	SWT1	SWT2	Triangulated
TMS	0.82	1.00	0.90	0.82	0.96	0.89
WSX	0.92	0.97	0.94	0.98	0.99	0.99
SVH	0.91	0.94	0.93	1.00	1.01	1.01
NWT	1.12	1.04	1.08	1.10	1.03	1.06
WSH	1.06	1.19	1.12	0.99	1.12	1.06
YKY	0.97	0.94	0.96	1.11	1.03	1.07
NES	0.95	1.09	1.02	1.05	1.11	1.08
ANH	1.17	0.97	1.06	1.20	1.04	1.12
SWB	1.27	1.19	1.23	1.21	1.20	1.21
SRN	1.75	1.47	1.61	1.31	1.21	1.26
Range	**0.93**	**0.53**	**0.71**	**0.49**	**0.25**	**0.37**

Note: Table showing improvement in Southern Water's efficiency score and reduction in efficiency score distribution when including coastal variable

Required Remedy

271. Ofwat develops sector-wide econometric modelling and a cost adjustment claims process so that companies are compensated for the efficient costs that are faced given their company-specific circumstances. This ensures that the models will most effectively determine the efficient level of expenditure for each company. This provides confidence that all companies can fund the base costs needed to deliver a strong level of customer service.

272. Ofwat has accepted that there are engineering justifications for higher costs at coastal sites. Allowing our efficient coastal treatment costs will enable us to be compensated for these. This will enable us to properly carry out our sewage treatment functions. This will in turn have a positive impact on service quality, which is in the interest of our customers.

273. To remedy the error identified, we propose that our cost adjustment claim is accepted, with an asymmetric adjustment equivalent to including the coastal population variable in the Sewage Treatment models. By allowing this cost adjustment our wastewater base cost allowance is increased by £125.6 million.

4. Out-of-model cost adjustments

273. Ofwat's out-of-model cost adjustments are often based on bespoke methodologies. These adjustments interact with other areas of the price control, for example with true-up mechanisms, as is the case for the energy price adjustment, for example.

274. It is crucial that the adjustments to modelled base costs are robust and prevent errors or introduced bias from cascading into other parts of PR24 framework. Furthermore, the consistent application of sector-wide adjustments where necessary is essential for maintaining the integrity of benchmarking.

275. Ofwat should follow the principles and precedents they have applied elsewhere in the cost assessment framework when performing out of model adjustments.

276. In the FD, Ofwat has made two errors relating to out-of-model adjustments.

a) First, Ofwat has set an overly challenging frontier shift assumption which does not reflect the market conditions we will face at AMP8, nor does it reflect recent productivity trends observed in comparator sectors. This introduces a £129m funding challenge relative to our recommendation derived from the latest available productivity data.

b) Second, we have identified issues within Ofwat's approach to the energy costs adjustment. Our AMP8 implicit energy cost allowance has been underestimated following the use of a five-year historical window to inform the assumed power cost share, as opposed to the full series of historical data available. Ofwat also sets an unrealistic glide path for future energy prices, beyond the reduction assumed by Government forecasts. Correcting for these issues, by modelling costs over a longer period and using a more justifiable glide path, increases our allowance by £54m. Ofwat's failure to ensure that these adjustments were based on a robust and evidence-based approach has therefore created material underfunding.

277. Finally, in our DD Response, we explained that Ofwat's approach to funding capital maintenance through the overall base cost allowance is not sustainable as it does not account for the health of the asset base. Ofwat has acknowledged that asset health may be an issue across the sector and in the FD it set out its intended approach to understanding more about asset health by PR29, to enable it to make further sector-wide adjustments to the core base allowance.

278. This approach, whilst welcome in principle, lacks definition and clarity. The issue should be adjusted at source in the first instance (i.e. in the price control for AMP8) with a further adjustment made during AMP8 if necessary. Ofwat's approach would ultimately push the problem out into the future, but there are specific asset health related issues which need to be addressed now. Ofwat has made an error in not directly providing specific funding to address our asset health issues in AMP8.

279. The following sections go into each error in more detail, summarising the representations to date and the flaws within Ofwat's FD methodology.

4.1.1. Error 6: Applying a 1.0% per annum frontier shift

The issue

280. Frontier shift is the year-on-year ongoing efficiency estimate that Ofwat assumes for the water sector during each AMP. It represents the ongoing efficiency improvements that even the most efficient company can achieve. It acts to reduce the cost allowances set by Ofwat at the start of the AMP as companies are expected to deliver the same level of performance for less money after each year.

281. Ofwat set a frontier shift challenge for PR24 by considering: on-going efficiency improvements in the economy that the water sector should be able to emulate; efficiency improvements driven by the innovation fund;[199] and additional efficiency improvements that might be possible as the water sector 'catches up' to the efficiency of competitive sectors. Ofwat did not consider things that are outside management control within the frontier shift. Examples include regulatory changes, which can impact a company's ability to improve efficiency; economic fluctuations, where recessions or periods of high inflation can impact a company's costs and make it difficult to isolate the impact of efficiency improvements; and natural disasters, which can disrupt operations and make it difficult to assess long-term efficiency trends.

282. Ofwat also aimed to set efficient base costs in such a way that the most efficient companies may receive a cost allowance which is higher than forecast in their Business Plans. This is to ensure a strong incentive for companies to seek efficiencies and submit stretching Business Plan forecasts.

283. In PR14 there was no separate frontier shift challenge applied, as this was incorporated into the wholesale base cost econometric models. At PR19 there was a separate frontier shift efficiency challenge of 1.1% applied per year but extended to all wholesale base costs.[200] However, in the CMA PR19 Redetermination, the CMA reverted to a frontier shift of 1% per year.[201] Unmodelled base costs and wastewater WINEP enhancement costs were also subject to a net frontier shift estimate.[202]

284. For PR24 Ofwat applied a frontier shift challenge to all enhancement expenditure, noting that for PR19 it had applied a frontier shift challenge to common enhancement areas, including wastewater industry national environment plan (**WINEP**) and metering costs. Ofwat assessed that the potential gains from productivity improvements were likely to be significant for large, relatively homogenous programmes of work that are common across companies. Ofwat also argued that the frontier shift assumptions on enhancement expenditure from companies tended to be limited.

Summary of previous representations

285. The water sector has continually struggled to meet the frontier shift challenge set by Ofwat, and the current low productivity environment in the UK would suggest that this will continue for the foreseeable future. Southern Water, along with Affinity Water, South East Water, Welsh Water, Wessex Water, Thames Water, and United Utilities argued for a frontier shift efficiency challenge of

[199] Ofwat, Innovation Fund, SOC-2-0031.
[200] Ofwat, December 2019, PR19 FD: Securing cost efficiency technical appendix, page 121, SOC-2-0008.
[201] CMA, March 2021, Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations, page 1162, SOC-2-0009.
[202] Ofwat, December 2019, PR19 FD: Securing cost efficiency technical appendix, page 176, SOC-2-0008.

around 0.5%. This was based on a report from Economic Insights and is the midpoint of the 'focussed range' for frontier shift suggested by Economic Insights of 0.3%-0.7%.[203]

286. This was rejected by Ofwat in the FD. Ofwat concluded that the evidence presented did not justify a different assumption to the DD. It asserted that its frontier shift assumption was a conservative estimate, on the basis that evidence from CEPA could support a more stretching challenge of up to 1.2% per year (e.g. including embodied technical shift, AI driven acceleration in productivity growth in the coming years, better use of big data and robotics, and step change in investment over the 2025-30 period, which should facilitate a 'learning by doing' productivity effect).[204]

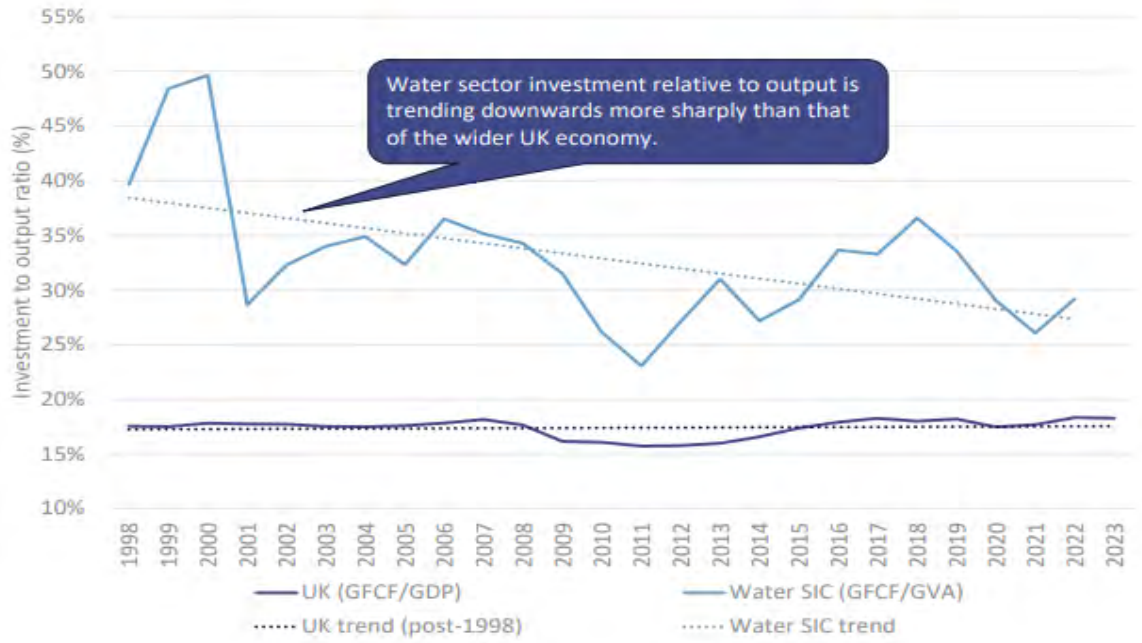
Under a benchmarking approach to determining frontier shift, one would expect the challenge to be 'higher' at times of high productivity and 'lower' at times of low productivity

287. Under a benchmarking approach to determining frontier shift, one would generally expect the challenge to be 'higher' at times of high productivity and 'lower' at times of low productivity, as during times of high productivity it would be expected that the water sector would benefit from the drivers of wider productivity performance, and the same is true for the opposite. Given the UK's general productivity slowdown, this economy-wide slowdown would be expected to affect the water sector.[205] Indeed, the water sector is the second worst performing sector in terms of labour productivity growth between 2008-2019 according to a recent study.[206] Recent ONS data provides further evidence of the water sector's sluggish performance. It shows that 'water supply; sewerage, waste management and remediation activities' achieved a multifactor productivity growth of -0.73% from 2020 to 2021 and just 0.04% from 2021 to 2022.[207]

288. Ofwat's framework for setting long term price controls setting long term capital investment requirements partially mitigates the risk of underinvestment. However as shown in Figure 20, the regulatory certainty associated with the water sector has not prevented underinvestment. In fact, investment into the sector has been rapidly declining since 1998 (using an investment to output ratio) compared to the UK as a whole. This is consistent with the 2023 review by the House of Lords Industry and Regulators Committee, which concluded that "*Ofwat has failed to ensure companies invest sufficiently in water infrastructure, choosing to keep bills low at the expense of investment. Greater investment in the water industry is now urgently needed*".[208]

[203] Economic Insight, March 2025, Frontier shift at the PR24 redeterminations, page 6, SOC-2-0066.
[204] Ofwat, February 2025, PR24 FD Expenditure allowances, page 268, SOC-1-0006.
[205] Economics Observatory, January 2024, What explains the UK's productivity problem?, SOC-2-0033.
206 D. Coyle, J. Mei, March 2022, Diagnosing the UK Productivity Slowdown: Which Sectors Matter and Why?, page 2, SOC-2-0034.
207 ONS, Multi-factor productivity, annual, UK, SOC-2-0081.
208 House of Lords Industry and Regulators Committee, March 2023, The affluent and the effluent: cleaning up failures in water and sewage regulation, SOC-2-0052.

Figure 20: Investment relative to output for UK overall compared to water sector[209]



Source: Economic Insight

289. Ofwat has argued, based on the report from Europe Economics, that the sluggish growth of productivity in the UK was not due to lower investment. This is contrary to recent academic literature.[210][211] [212] The Centre for Economic Performance in their June 2024 report find that low levels of investment was one of the leading reasons for UK underperformance.[213] The evidence suggests that this low level of investment may also be affecting the water sector's performance. Economic Insight in their survey of productivity experts found that: the extent of investment (both private and public); the quality of infrastructure; the quality of human capital stock; and management quality, were the most important factors for explaining the slowdown in productivity growth.[214]

Historical data show that, factually over PR14 and PR19, the water industry delivered low productivity, in-line with the low and flat productivity performance of the UK.

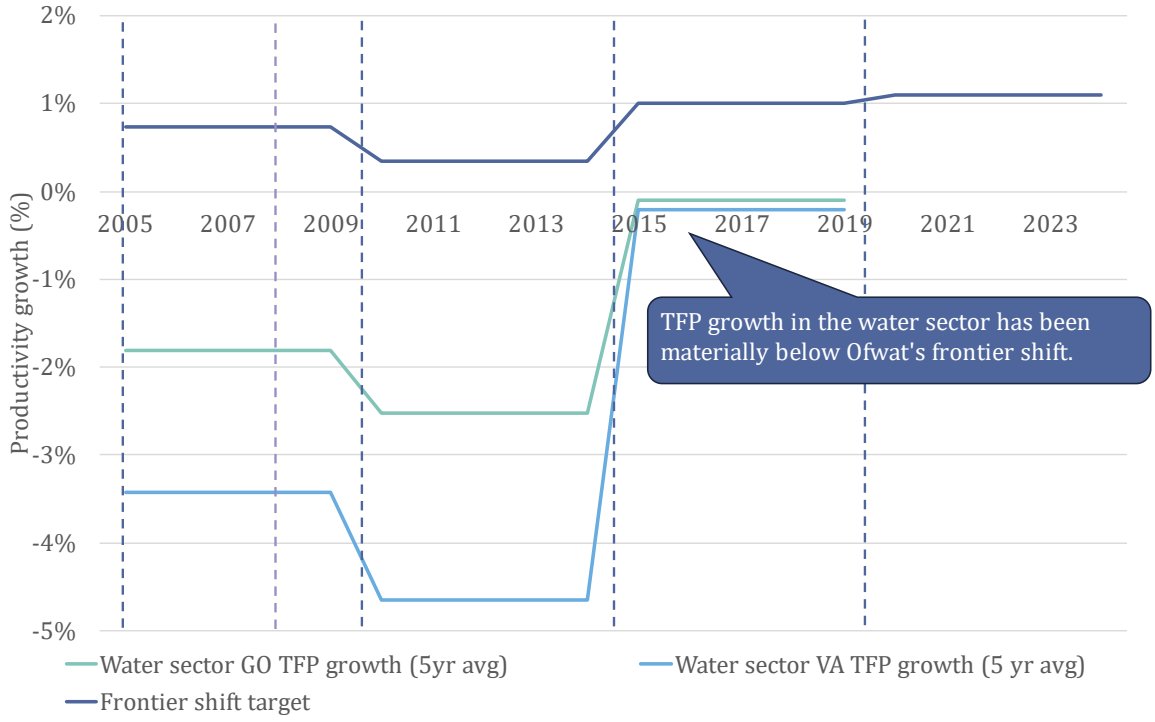
290. The approach taken in the FD does not reflect the current low productivity environment. The main factors contributing to a low productivity environment in the UK are largely economy wide, and the trends in investment do not suggest that the water industry has been protected from underinvestment. Historical data shows that over PR14 and PR19, the water industry delivered low productivity, in-line with the low and flat productivity performance of the UK. Looking over PR14 and PR19, it appears that Ofwat's frontier shift assumptions have been overly optimistic with

[209] Economic Insight, August 2024, The Importance Of A Balanced Approach To Frontier Shift, page 6, figure1, SOC-2-0032.
[210] S. Williams et al. , July 2024, The UK Productivity Puzzle: A Survey of the Literature and Expert Views, SOC-2-0053.
[211] Economics Observatory, January 2024, Boosting productivity: why doesn't the UK invest enough?, SOC-2-0035.
[212] D.Zenghelis et al., January 2024, Boosting growth and productivity in the United Kingdom through investments in the sustainable economy, SOC-2-0036.
[213] J. Reenen, X. Yang, June 2024, Cracking the Productivity Code: An international comparison of UK productivity, SOC-2-0037.
[214] Economic Insight, March 2025, Frontier shift at the PR24 redeterminations, page 25-26, SOC-2-0066.

regards to productivity performance (as seen in the chart below).

291. Moreover, Ofwat's expectations appear optimistic even on the basis of evidence from outside of the water sector. Looking at sector level gross output TFP growth (1995 to 2019) using the EU KLEMS dataset, only 14 out of 46 sectors meet this 1% target, with the majority of these in high-tech industries such as telecoms; chemicals; and computing.[215]

Figure 21: Water Sector Productivity growth (%) compared to frontier shift target[216]

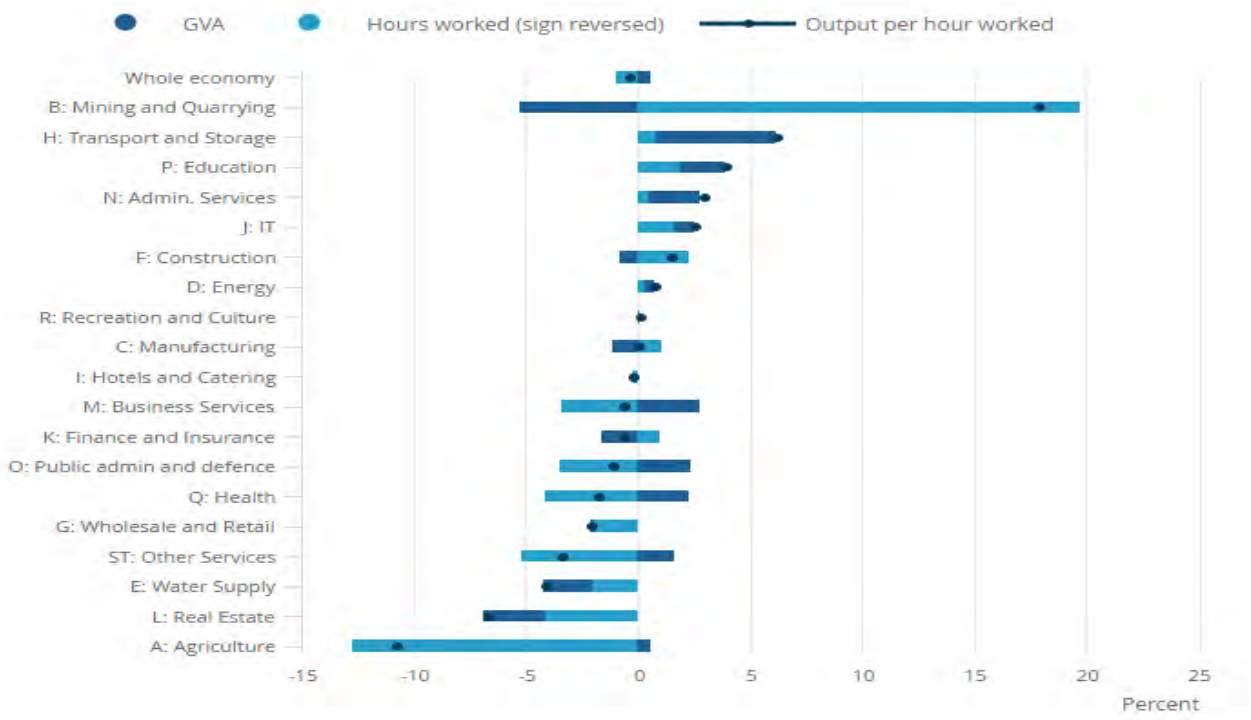


Source: Economic Insight

292. The most recent ONS data, decomposing the productivity of labour in a sector, has the water industry in the bottom 3 for productivity change over the period April to June 2024 (see chart below), with productivity growth being negative.

[215] Economic Insight, April 2023, Productivity and frontier shift at PR24, page 7, figure 2, SOC-2-0010.
[216] Economic Insight, March 2025, Frontier shift at the PR24 redeterminations, page 13, figure 2, SOC-2-0066.

Figure 22: ONS productivity flash estimate: decomposition of growth of output per hour worked and gross value added, quarter 2 (Apr to June) 2024 versus the same quarter a year ago[217]



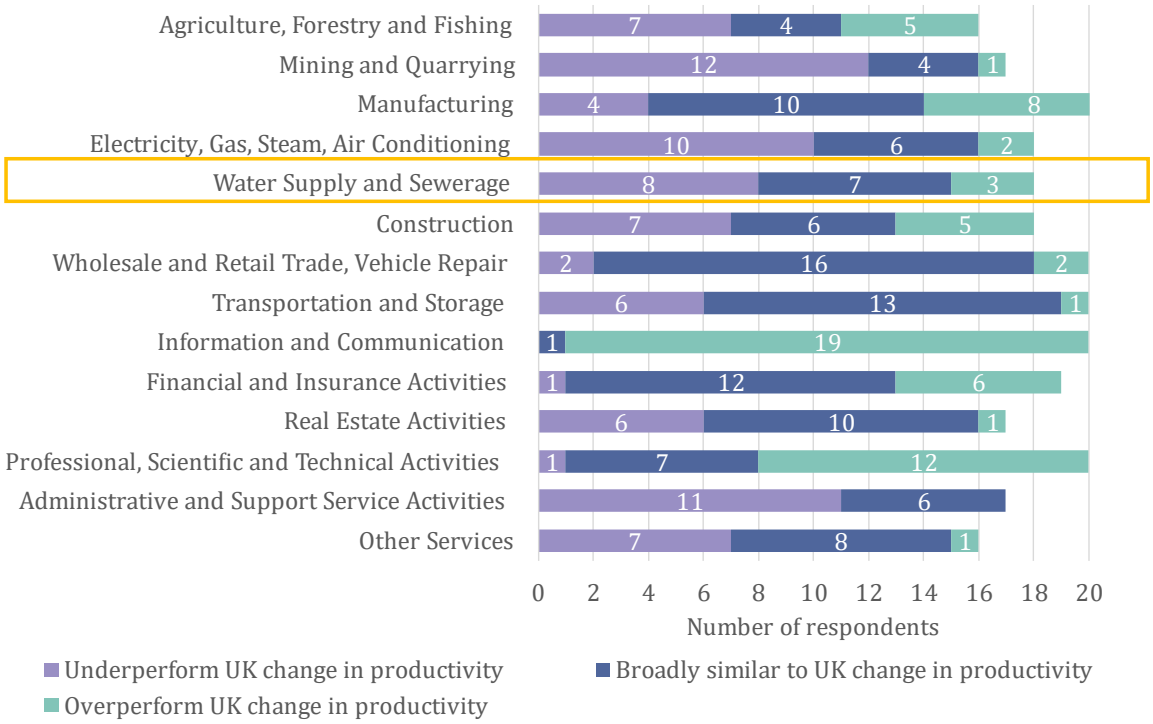
Source: ONS

293. This evidence shows an optimism bias in Ofwat's frontier assumption, with the result that the reality has not matched Ofwat's expectations over the last 15 years. Recent productivity data from the ONS does not show this trend reversing for the water industry during AMP8. Accordingly, the frontier shift assumption adopted by Ofwat in the FD should be revised downwards.

294. In an independent survey of academic experts, Economic Insight finds that 83% of respondents (15 respondents) expect the 'Water supply and Sewerage' sector to perform below or in-line with the UK average over the next 5 years (with just 3 expecting it to outperform).

[217] Office for National Statistics, August 2024, Productivity flash estimate and overview, UK: April to June 2024 and January to March 2024, figure 4, SOC-2-0038.

Figure 23: Expectations of how sector-level productivity might change over the next 5 years, compared to the expectation of how overall UK productivity might change relative to the previous 5 years[218]

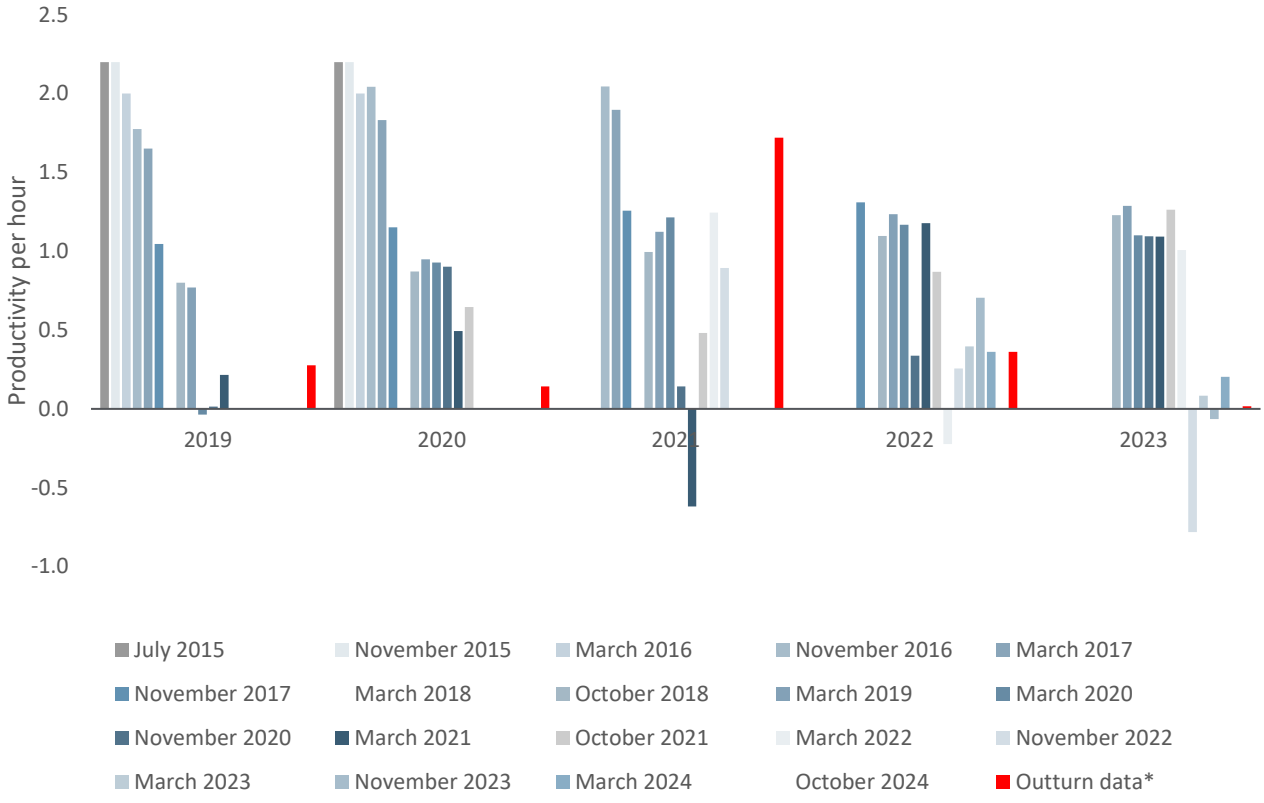


Source: Economic Insight

295. Ofwat, cites the OBR's central forecast as justification for the frontier shift target. However, this forecast is highly uncertain, and outturn data has often shown the OBR to be optimistic also. Indeed, outturn data in the OBR's two most recent forecast evaluation reports suggested that its forecast for the UK economy was optimistic.[219] Figure 24 below demonstrates how the OBR's productivity forecast evolves over time. It shows that the OBR forecasts for a particular outturn period are initially highly optimistic but tend to be revised downwards as the outturn period approaches. Figure 24 demonstrates that for the AMP7 period where outturn data is available, four of five years yielded outturn productivity measures that were significantly below initial OBR forecasts. Productivity estimates for these years were considerably below the one percent frontier shift challenge selected by Ofwat for PR19. This shows there is optimism bias in the OBR's approach to projecting productivity in the UK, and that using this forecast results in an unduly challenging and unrealistic level of frontier shift for companies. Excessive reliance on this data source should therefore be avoided in determining an appropriate level of frontier shift for AMP8.

[218] Economic Insight, March 2025, Frontier shift at the PR24 redeterminations, page 28, figure 7, SOC-2-0066.
[219] Office for Budget Responsibility, October 2024, Historical official forecasts database, SOC-2-0054.

Figure 24: Productivity per hour forecasts versus outturn, Office for Budget Responsibility[220]



Note: Figure 24 demonstrates that OBR productivity forecasts are overly optimistic with estimates tending to trend downwards as the outturn period approaches
Source: OBR

296. The OBR assumption of 0.2% in 2023 to 1.25% in 2029, suggests a significant improvement from the 0.66% average actually seen since the financial crisis. Ofwat has provided no evidence to suggest this is plausible other than assuming the water sector would grow in line with high-performance sectors, or that uncertain technologies will boost productivity growth substantially.

297. Alternative forecasts and evidence paint a different picture. The Bank of England's recent report states that *"GDP growth has been weaker than expected at the time of the November [2024] Monetary Policy Report, and indicators of business and consumer confidence have declined"*.[221] They expect growth over 2025-2027 to remain weak (averaging 1.25% a year[222]). This is driven by the Bank's judgement that TFP growth in the economy will remain low, assuming, productivity growth of 0% in 2025, 0.5% in 2026 and 0.3% in 2027 in their forecast.[223]

[220] Office for Budget Responsibility, Forecast evaluation report archives, SOC-2-0055.
[221] Bank of England, Monetary Policy Report - February 2025, page 4, SOC-2-0056.
[222] This is based on an average of the Bank of England's GDP growth projects for 2025 (0.75%), 2026 (1.5%) and 2027 (1.5%). Bank of England, Monetary Policy Report - February 2025, page 65, SOC-2-0056.
[223] Bank of England, Monetary Policy Report - February 2025, page 65, SOC-2-0056.

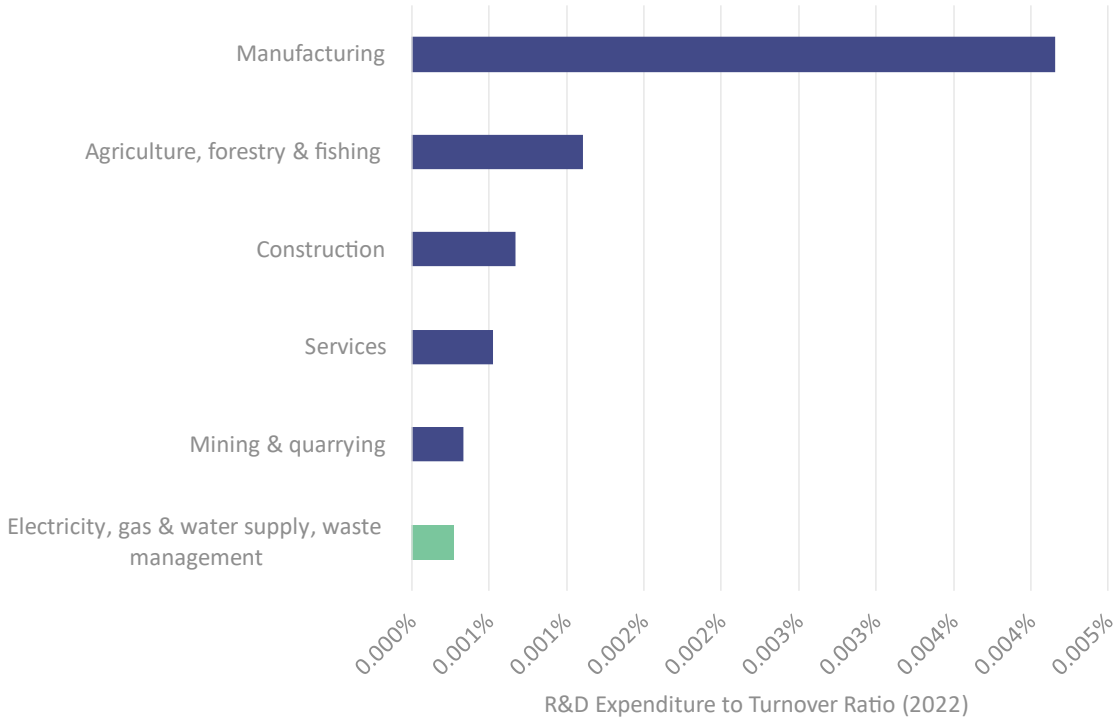
298. The latest ONS monthly GDP for November 2024 showed only 0.1% growth following on from a fall of 0.1% in October 2024 – these figures are not indicative of a growing economy (which, as noted above, would typically be expected if productivity was improving). HM Treasury's January Summary of Independent Forecasters finds that the productivity assumption used by these forecasters was on average 0.6% for forecasts made in February 2025 vs 0.7% for January 2025 vs the OBR's assumption in October of 1.0%. This is valuable data given that these forecasts take account of more recent economic information. Taken together the evidence suggests that productivity is unlikely to revert to anywhere close to pre-2008 levels rapidly, contrary to the implication of Ofwat's frontier shift of 1%, and most economic forecasters are more in line with Economic insights 'focussed range' for frontier shift (0.3%-0.7%).

The water industry is not intrinsically a 'high-tech' industry

299. Productivity data shows that productivity performance tends to be greater in more 'high-tech' industries, and lower in more 'low-tech' industries.

300. Ofwat's frontier shift assumption would imply that water supply could achieve economic performance comparable to that of high-tech industries. However, this may not be true for several reasons. The water industry provides a homogenous product the core features of which do not change, compared with an industry like pharmaceuticals which relies on constant innovation. The water supply sector also has very long-lived assets compared to high-tech industries. Economic Insight provides evidence that R&D spend in the water supply industry is many magnitudes smaller than most industries in the UK, which does not support the hypothesis of productivity being in line with high-tech industries (see chart below).

Figure 25: R&D spending for selected UK sectors relative to annual turnover[224]



[224] Economic Insight, March 2025, Frontier shift at the PR24 redeterminations, page 35, figure 8, SOC-2-0066.

Source: Economic Insight

301. A more plausible comparator industry is the electricity and gas network which is a similarly regulated industry. Companies in those sectors have proposed in their business plans a frontier shift challenge of 0.5% for gas distribution network companies, and 0.4%-0.7% for transmission companies.[225][226][227][228] There is no obvious reason why the water sector should be significantly more productive given they face similar constraints in terms of delivering a regulated homogenous product, and indeed as shown by Figure 22 above have achieved a lower level of productivity change than the energy sector.

302. In the FD Ofwat argued that companies have provided many examples of innovation projects in business plans, and that this is at odds with Economic Insight conclusion that there is little scope for innovation within the sector. They also contend that the sector benefits from R&D in other sectors when it purchases inputs, and hence it is not just the R&D carried out by water companies that is relevant. However, Ofwat did not outline the scale of these potential improvements and did not reference the highly uncertain nature of these projects. There is no guarantee these projects will be successful at scale to justify the 1% frontier shift, particularly in new and innovative areas such as AI.

303. Economic Insight in their latest report conducted an independent survey of technological experts and found that the majority did not expect the water industry to be significantly impacted by the technologies identified by Ofwat (AI, big data and robotics). The Economic Insight survey found that *"24 out of the 30 surveyed experts believe AI will not have a significant impact of the regulated water industry (and 2 experts are not sure). Similarly, 26 out of 30 experts believe big data will not have a significant impact (and 1 expert is not sure), and 25 out of 30 experts believe robotics will not have a significant impact (and 1 expert is not sure)."*[229] This supports the argument that these advancements in technologies may not lead to the productivity improvements envisioned in the current frontier shift argument.

Double counting of efficiency challenge for enhancement costs

304. In PR19 Ofwat did not apply frontier shift to all enhancement costs in the same way as base costs– but that was due to nature of modelling carried out as there was often a larger efficiency challenge (c. 5%) already included in model. This was challenged by the CMA, which applied frontier shift to enhancement as there was no evidence that frontier shift was being included by companies in their plans.

305. In PR24, we have already implicitly included an efficiency challenge in our enhancement plans. This is evidenced by the contracts we already have in place for enhancement spending over PR24. Most of the projects over AMP8 will be delivered using Target Cost contracts, though this is usually for projects that are relatively low risk, for example the work at [redacted] which is mainly an offline build with a tie-in to existing works prior to commissioning. These types of contracts already have set a target cost that already incorporates efficiency assumptions. Therefore, frontier shift

[225] SGN, December 2024, Cost assessment and benchmarking, page 27, SOC-2-0057.
[226] SP Energy Networks, December 2024, Cost Assessment and Benchmarking Approach (including RPEs & OE) RIIO-T3 Business Plan SP Energy Networks, page 71-72, SOC-2-0058.
[227] National gas transmission , December 2024, NGT A12 - Cost assessment and benchmarking approach, page 5, SOC-2-0059.
[228] National Grid, December 2024, RIIO-T3 Business Plan, page 75, SOC-2-0060.
[229] Economic Insight, March 2025, Frontier shift at the PR24 redeterminations, page 21-22, SOC-2-0066.

should not be applied for all enhancement cost categories, as doing so would impose a second layer of efficiency challenge, creating an unreasonable target to achieve.

306. Contracts that do not set a target cost are instead often drawn up as cost-reimbursable, meaning that we will pay the actual cost of the project rather than a targeted cost which tends to be more expensive as costs are less well known. This is typically for projects considered high-risk due to the age and condition of the assets, where the delivery partner does not want to take on the risk of achieving a target cost. Two notable examples are our [redacted] and [redacted] sites. In such cases, the cost-reimbursable nature of the contract means that while there could be efficiencies for these projects over the AMP this is likely to be limited, and this is caused by the complexity of these projects.

Learning-by-doing efficiency gains are less likely to materialise in this AMP

307. In the FD, our capital investment programme would double in size over 5 years relative to AMP7 (c.£3.5bn[230] vs c.£8.5bn[231]). Due to the scale of the increase and the retendering processes required, we have had to utilise new delivery partners, starting from scratch with many of them. Compared to being able to use old. Whereas existing delivery partners may already understand our assets and our needs, we need to commence this process again with new partners. The initial learning costs associated with this may mean that envisioned efficiency gains over the AMP may not be realised due to initial learning costs.

308. We will be going from six suppliers delivering our AMP7 programme to a total of twelve. Four of these are partners with whom we have never worked before. These new delivery partners will account for 25% of the capital programme. The number of delivery partners working concurrently on similar projects is likely to be a risk factor affecting the efficient delivery of programmes. This is due to not being able to share insights from similar completed projects to improve delivery until later during the process of other similar projects starting at the same time, or the insights only being shared with similar projects starting later in the AMP.

309. As explained further in Chapter 5: Price Control Deliverables, the PCD framework discourages efficiency. We would be incentivised to complete more advanced projects in our programme in order to guarantee delivery of PCD outputs, even if progressing new projects may in fact be more efficient. The PCD framework could also create the perverse incentive to overspend inefficiently in order to meet the prescribed PCD delivery date.[232]

310. Furthermore, the speed with which we will need to make step changes means that a learning-by-doing process may be less feasible than Ofwat expect. The need to work with multiple partners and to work to deliver projects at pace will mean there is less time to be able to learn-by-doing as this can lead to inefficiencies in delivery in the short-term.

311. For example, for mains renewal we had planned to initially deliver 20km in the first year of AMP8, increasing to 100km by year five, in order to allow for incorporating lessons learned and bringing efficiencies through the lifecycle of AMP8. Initially planning to deliver 20km in year 1 and ramping up to 100Km by year 5. However, in the FD Ofwat set a flat requirement for delivery of 54km in year 1. This is a substantial step change from the requirements of AMP7 and will require the engagement of multiple delivery partners in addition to our existing senior delivery partners. This is

[230] Ofwat, December 2019, PR19 Final Determinations: Securing cost efficiency technical appendix, page 165, table A1.1: Totex, SOC-2-0008.
[231] Ofwat, December 2024, PR24 Final Determination - Efficient Expenditure allowances - summary tables, Table 55, SOC-2-0061.
[232] For more details see Error 4 of Chapter 45: Price Control Deliverables.

likely to create inefficiencies in working, greater burden on the project management team and therefore a higher cost per metre.

312. A large portion of the programme is not just rolling over technology that is well established and therefore more likely to bring efficiencies. For example, in wastewater, new greener solutions are required. This comes with an efficiency cost as there is a new learning process required to understand how best to implement it and deliver it in as efficient a manner as possible. For example, for the [redacted] FEO works, it will be delivered by a different delivery partner, with Phase 4 of the project utilising new technology for both Southern and the delivery partner for the ceramic membrane plant.

313. For these reasons, the step change in investment required in AMP8 is likely to lead to a more inefficient delivery profile than if the level of investment was maintained. CEPA and Ofwat have assumed that the step change in investment over the 2025-30 period, should facilitate a 'learning by doing' productivity effect.[233] This is unlikely to be achieved in reality as water companies will have limited time to stop and reflect on what has been done to date – as the programme timetable requirements are too relentless.

Required Remedy

314. We request that the CMA sets the Frontier Shift at 0.5% per annum which we believe provides a realistic stretch challenge, which is mindful of previous past performance, the UK's overall economic underperformance, and some of the unique challenges of AMP8 in terms of the scale and pace of delivery and inefficient incentives due to PCDs, meaning some learning-by-doing efficiency gains may not materialise.

315. Setting a too challenging level of frontier shift will mean that the overall allowance across the AMP, particularly in the latter years, is not sufficient to fund the activities that are required. An accurate measure of the frontier shift challenge reduces the risk of firms being underfunded due to unrealistic cost targets. This means that companies have sufficient funding to deliver on all the necessary programme of work.

316. Changing frontier shift to 0.5% will have the increase our cost allowance by the following amounts across each price control across both base and enhancement costs:

- Base Costs:[234]
  - Wastewater Network Plus – £37m
  - Wholesale Water - £16m
  - Bioresources - £5m
  - Residential Retail - £7m
- Enhancement Costs: [235]
  - Wastewater Network Plus – £32m
  - Wholesale Water - £24m
  - Bioresources - £4m

[233] Ofwat, February 2025, PR24 FD Expenditure allowances, page 268, SOC-1-0006.
[234] Southern Water, Error 6 - Frontier Shift, worksheet "base summary output", SOC-2-0072.
[235] Southern Water, Error 6 - Frontier Shift, worksheet "enhancement summary output", SOC-2-0072.

4.1.2. Error 7: Estimating our AMP8 power cost share based on only five years of historical data and setting an overly optimistic Real Price Effect in the energy allowance adjustment

The Issue

317. In the FD, Ofwat adjusted modelled base cost allowances to account for elevated energy prices since the energy crisis began in 2021. As we look to AMP8, energy prices remain above pre-crisis levels and there is significant uncertainty on when prices will normalise. Ofwat's energy adjustment methodology comprises of three core components at final determination:

a) Modelled efficient energy costs by company i.e., the implicit energy allowance for AMP8

b) The energy price 'uplift factor' to be applied to the implicit energy allowance

c) The forecast energy Real Price Effect (RPE) to be applied over AMP8 which will be subject to a true-up

318. Ofwat has made two errors within the energy adjustment methodology. These errors introduce material funding challenges and cashflow risks for us at AMP8. Ofwat has a duty to *'secure that water companies can finance the proper carrying out of their statutory functions'*[236] in AMP8. Ofwat must apply out of model adjustments based on the best available evidence and adopt an approach which is aligned with the base cost assessment principles it set out for PR24. In the FD, Ofwat has employed an energy adjustment methodology which fails to fulfil its statutory functions and contradicts its own cost assessment principles.

319. Firstly, Ofwat has derived our AMP8 implicit power cost share assumption (i.e., the percentage of base expenditure spent on power) using a brief window from 2019/20 to 2023/24. This short window does not reflect our power cost share going into AMP8. We were well hedged during this period when energy prices increased to unprecedented levels. This means our observed power cost share over these recent years is untypically low. By selecting this short window, Ofwat has estimated a power cost share which is not reflective of our expected share in AMP8. Since we have now exited these hedged positions our true power cost share is far greater. Ofwat's approach underestimates our AMP8 adjusted power cost allowances by £22.3m and £8.8m[237] in the Wholesale water and Wastewater network plus price controls respectively. This is based on analysis by KPMG which uses the entire historical period (2011/12 to 2023/24) to estimate our power share assumptions. This is aligned with Ofwat's approach to modelling base costs elsewhere in the PR24 framework. This approach is aligned to principle seven set out by Ofwat – "*a coherent cost assessment approach that drives the right incentives".*[238]

320. Secondly, Ofwat has applied an unrealistic RPE based on "*taking the view that energy prices will have 'normalised' by the end of AMP8".*[239] This view is not grounded in available evidence on energy price forecasts which predict prices will remain at levels above those implied by Ofwat's RPE. The RPE will be subject to a true-up with outturn energy prices, but in taking this approach to estimating the RPE, Ofwat has created an undue cashflow risk until the true-up occurs. It fails to fulfil its financing duty by introducing this risk in an already challenging AMP8 environment. Its decision to remove "*the need for the adjustment to rely on particular data points*"[240] forgoes the

[236] Ofwat, Our Duties, SOC-2-0039.
[237] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 24, SOC-2-0065.
[238] Ofwat, December 2024, PR24 FD: Expenditure allowances – base cost modelling decision appendix, page 15, SOC-2-0001.
[239] CEPA, February 2025, PR24 FD – Real Price Effects and the energy crisis cost adjustment mechanism, SOC-2-0040.
[240] CEPA, December 2024, PR24 FD – Real Price Effects and the energy crisis cost adjustment mechanism, SOC-2-0040.

opportunity to use evidence to inform a realistic RPE. KPMG estimate that this creates a further £12.1m and £28.5m[241] uncompensated cashflow risk in the Wholesale water and Wastewater network plus price controls,[242] respectively when using an RPE derived from the HMT Green Book data tables on energy valuation.[243]

Summary of previous representations

321. Following the unprecedented surge in energy prices witnessed in 2021, our October 2023 Business Plan submission advocated for an energy cost uplift to base allowances. We also proposed the introduction of an ex-ante energy RPE to account for the inherent uncertainty surrounding future energy price fluctuations. Recognising the likelihood of a sector-wide adjustment to allowances, we chose not to submit a separate cost adjustment claim.

322. In the DD, Ofwat proposed an ex-ante energy uplift and RPE. However, Ofwat's application of an unrealistic energy RPE, which did not account for the lag between the wholesale market and standard hedging practices in the sector, resulted in an overall downwards adjustment to energy allowances for the sector. We expressed concerns with Ofwat's approach as part of our DD Response. Specifically, we highlighted the cash flow risks that a negative adjustment could present.

323. In our DD Response, we advocated for a true-up made via an operating expenditure adjustment, allocating any reconciliation through pay-as-you-go revenue to reduce cash flow risks. Given that the DD adjustment resulted in a negative adjustment following the application of an unrealistic RPE, we focused our DD Response on the risks this would create and the issues around the formulation of the RPE.

Ofwat has underestimated our AMP8 implicit energy allowance having estimated our power cost share with only five years of historical data

324. Analysis performed by KPMG finds that Ofwat's approach to estimating our implicit energy allowance for AMP8 results in an understatement of our implicit power cost allowance by £31m across the Wholesale water (£22.3m) and Wastewater network plus (£8.8m) price controls.[244]

325. This error falls outside the scope of any true-up against realised energy prices, as it concerns the implicit energy allowance input into Ofwat's PR24 energy price reconciliation model, which only trues up on outturn prices as opposed to overall power cost (which is a function of price and consumption).

326. Ofwat estimates the AMP8 implicit power cost allowance by multiplying our AMP8 modelled base costs allowance by the assumed power cost share assumption. This assumption is intended to reflect the portion of base costs forecast to be spent on power costs in AMP8. Ofwat has estimated this using five years of historical data spanning 2019/20 to 2023/24. This approach foregoes the opportunity to utilise the longer series of historical data available from 2011/12 to 2023/24, which is typically used by Ofwat when available. This would capture the long-term trend in our power cost share by removing distortions driven by hedging strategies.

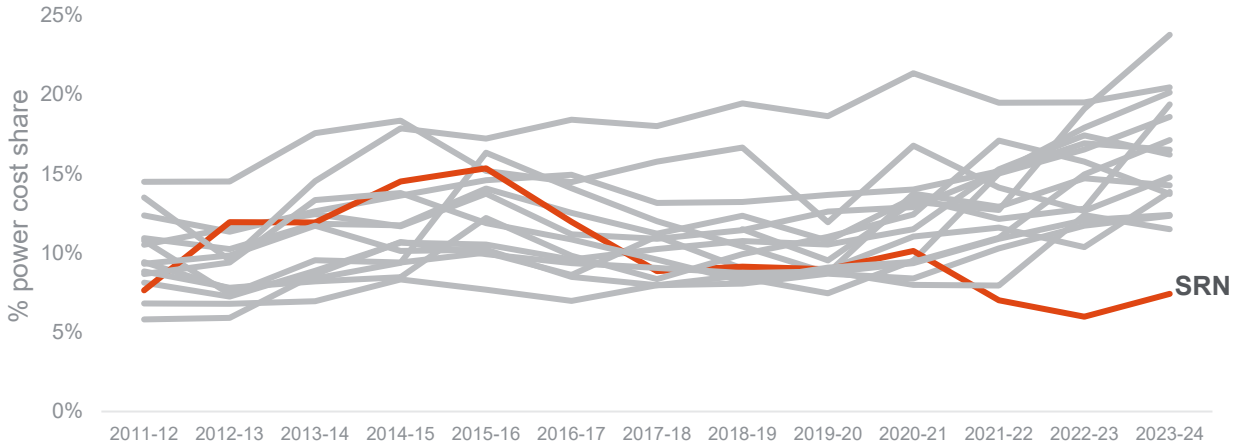
[241] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 26, SOC-2-0065.
[242] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 26, SOC-2-0065.
[243] DESNZ, Data-tables-1-19, Table 4 – Retail Electricity Prices, Industrial user, SOC-2-0079.
[244] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 25, SOC-2-0065.

327. In 2021, when energy prices increased sharply, our proactive commercial power purchase strategy effectively hedged our power costs. This strategy insulated our operations from the unprecedented energy prices witnessed between 2021 and 2024. While this strategy successfully controlled our power costs, it resulted in an exceptionally low observed power cost share for that period. This is because we had effectively secured large portions of our power costs in advance, while unprecedented inflation drove expenditures in other areas of base expenditure upwards. In using the five-year period when we were well hedged, Ofwat has failed to capture our unique circumstances compared to the rest of the sector when estimating the power cost share assumptions.

328. Our unique circumstances can be seen in Figure 26 below. Even though variation in power cost shares between companies is expected, it demonstrates that after 2021 we see a marked fall in our power cost share which strongly contrasts the upwards trend seen in the rest of the Wholesale water sector.[245]

329. Figure 27 and Figure 28 clearly demonstrate this impact, showcasing a marked decline in our power share within Wholesale water and Wastewater network plus base costs since 2020/21 compared to the rest of the sector.

Figure 26: Wholesale water power cost share for Southern Water compared to the rest of sector, 2011 -2024[246]



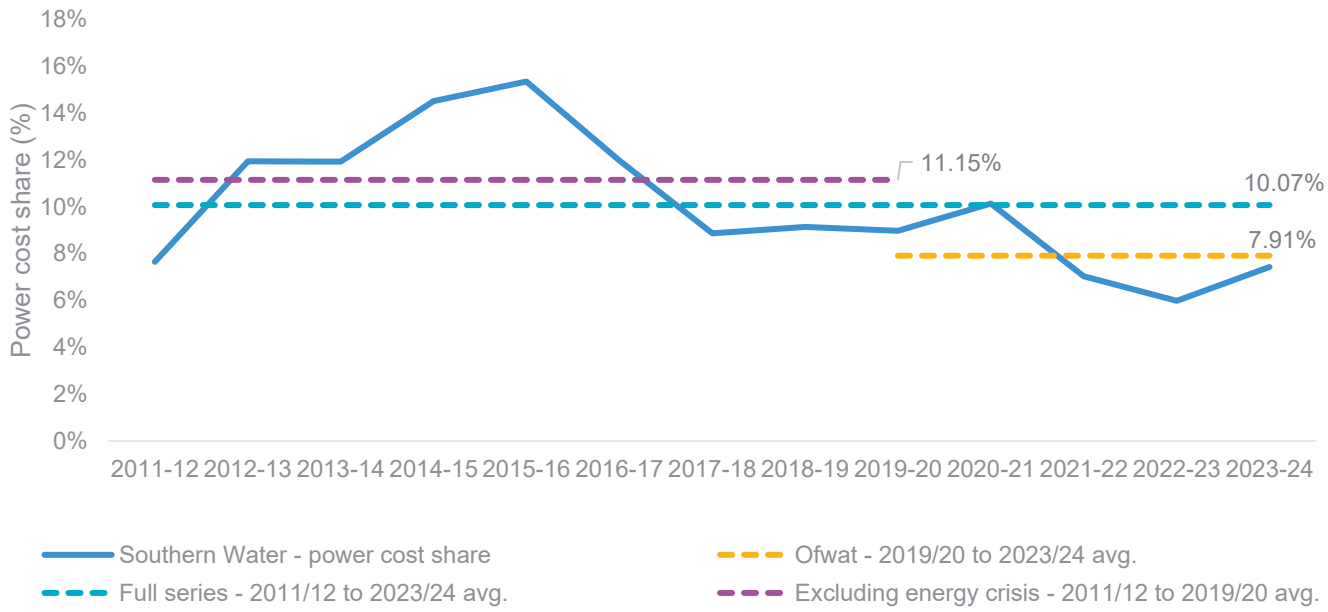
Source: KPMG analysis

330. The five-year period used by Ofwat to estimate our power cost share for AMP8 is based on an exceptionally short window of extraordinarily high energy prices that do not accurately reflect future energy price trends. Furthermore, considering our power costs were effectively hedged during this period, the estimated power cost share is skewed downwards. KPMG find that the impact of our hedged position on our power cost share is most evident in 2022/23, as shown in Figure 27 where our power cost share fell to 5.93% of base costs in Wholesale water[247]. Now that we have exited

[245] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 23, SOC-2-0065.
[246] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 23, SOC-2-0065.
[247] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 23, SOC-2-0065.

our hedged position, our power cost shares are significantly higher, rendering the five-year window unrepresentative of the true power cost share we will face in AMP8.

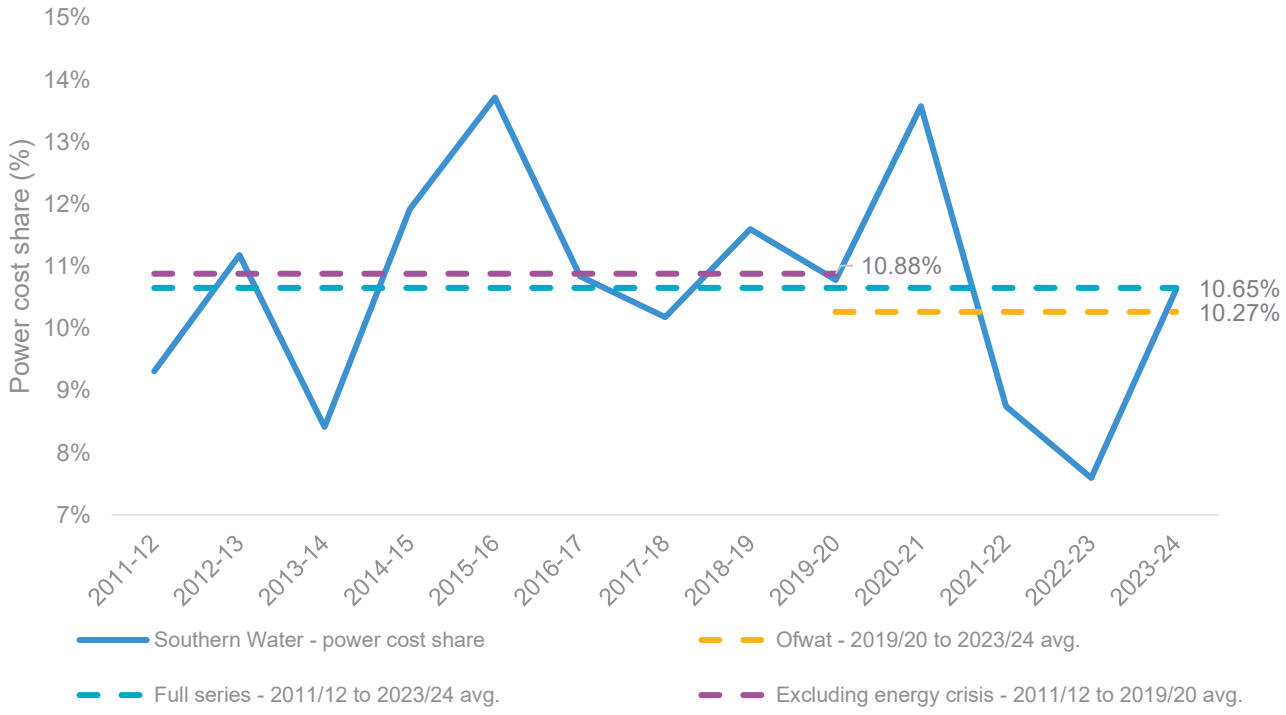
Figure 27: Southern Water wholesale water power cost share and averages over different time periods (%)[248]



Source: KPMG analysis

[248] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 24, SOC-2-0065.

Figure 28: Southern Water wastewater network plus power cost share and averages over different time periods (%)[249]



Source: KPMG analysis

331. As shown in Figure 27 above, for wholesale water, KPMG estimate our power cost share for the five-year window is 2.16% lower than the share estimated from the full series available. For wastewater network plus, KPMG estimate that the full period results in 0.38% higher power cost share assumption.

332. There is further rationale to exclude the period from 2020/21 onwards when deriving a power cost share assumption given energy prices within this period are outliers. Figure 27 and Figure 28 demonstrate that using the period 2011/12 to 2019/20 when energy prices were stable results in a further increase in our power cost share assumption across water and wastewater price controls.

333. As Table 24: below demonstrates, KPMG estimate that applying the energy price adjustment while utilising the power cost share based on the full modelling period results in an additional implicit energy allowance of £22.3 million and £8.8 million in the wholesale water and wastewater network plus price controls, respectively[250].

[249] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 24, SOC-2-0065.
[250] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 24, SOC-2-0065.

Table 24: Impact of power cost share based on five-year period versus full historical period[251]

	Wholesale water		Wastewater network plus	
	Ofwat FD - 5-year window	Full historical period	Ofwat FD - 5-year window	Full historical period
Power cost share (%)	7.91%	10.07%	10.27%	10.65%
Implicit energy allowance (£m)	65.59	83.51	189.3	196.4
Uplift including RPEs (£m)	15.97	20.33	46.0	47.7
Total energy allowance (£m)	81.56	103.84	235.2	244.1
Difference (£m)	**22.28**		**8.8**	

Source: KPMG analysis

Ofwat's decision to use a five-year window goes against precedents that they established elsewhere in the modelling framework

334. Ofwat's decision to use a short window whilst an extended series of data is available goes against its own modelling guidelines and precedent it has established elsewhere in the cost assessment framework. Ofwat has stated, for example, that *"We use a long time series of historical data from water companies, going back to 2011-12 for wholesale water and wastewater, and 2013-14 for residential retail, to estimate our base cost econometric models. This also helps to capture the cyclical nature of capital maintenance expenditure".*[252] There is value in including as much historical information as possible when building base cost models to ensure that cyclical issues or anomalies in specific years are evened out over a longer period.

335. The approach of using a five-year window to estimate our power cost share is also inconsistent with the methodology used elsewhere in the energy adjustment model. For example, to estimate the uplift factor applied to power costs Ofwat has estimated 2023/24 energy prices as proportion above the average price during 2011/12 to 2023/24 (the full modelling period available).

Ofwat's use of a five-year window to estimate the power cost share assumption underfunds us due to our effective hedging strategy during the energy crisis

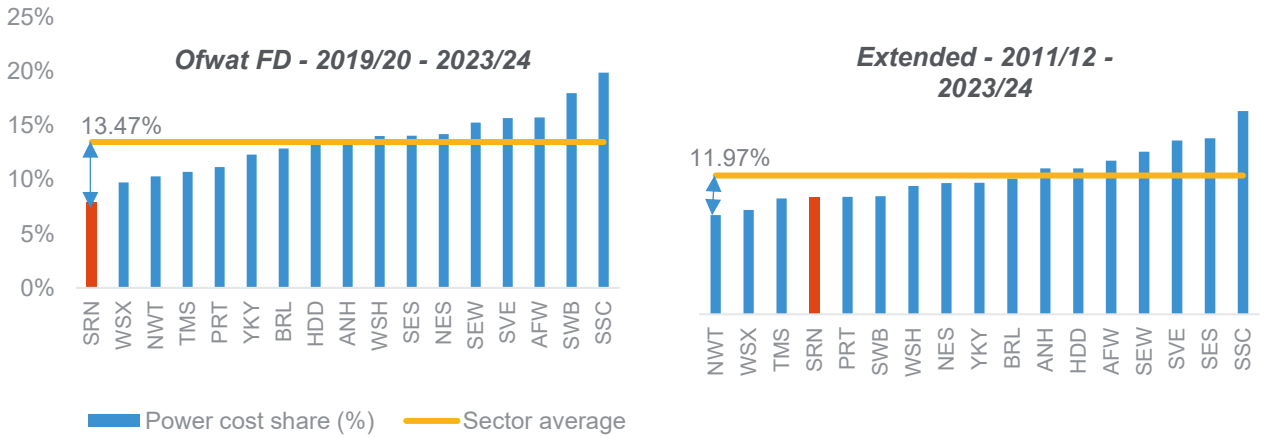
336. Future energy prices are inherently uncertain, and we understand the importance of adopting a prudent hedging strategy to ensure we are insulated from volatile energy prices whilst controlling costs for customers. Even a company with a conservative hedging strategy will face fluctuating power costs, particularly as they enter and exit hedged positions and become exposed to present market conditions.

[251] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 24, SOC-2-0065.
[252] Ofwat, December 2024, PR24 FD: Expenditure allowances – base cost modelling decision appendix, page 113-114, SOC-2-0001.

337. There is strong rationale to use the longer time series to estimate the power cost share assumption to capture long-term trends and average out phases of company hedging cycles. Companies should not be overly incentivised to hedge due to the risk premium that must be paid for price certainty. Companies who have historically hedged effectively should not be penalised by having an unrealistic power cost share assumed within Ofwat's energy adjustment.

338. Figure 29 below shows that there is convergence towards the sector average of company power cost shares when using the time series extending back to 2011/12 in Wholesale water. A similar effect can also be seen when using the longer series in the wastewater network plus sector. While we anticipate variations in power cost shares between companies, this convergence is likely driven by the extended time series balancing out hedging strategies over time and capturing the long-term tendency of power cost shares.

Figure 29: Wholesale water power cost share - 2019/20 to 2023/24 (left), 2011/12 to 2024 (right)[253]



Source: KPMG analysis

339. This demonstrates that in using a short window where we were well hedged to estimate our power cost share assumption, Ofwat has significantly underestimated our AMP8 power cost allowance and failed to consider our unique circumstances. This underestimation leads to our energy adjustment subsequently being underestimated as well, leaving us underfunded to cover energy costs amidst elevated prices.

Ofwat has applied an overly optimistic RPE forecast to AMP8 energy allowances which creates a cashflow risk for companies.

340. Ofwat has applied an ex-ante RPE to energy prices at AMP8 to account for the expected fall in prices to pre-crisis levels. Going into AMP8 energy prices are inherently uncertain as ongoing geo-political conflict could yet cause further disruption. Ofwat has introduced a true-up mechanism which will reconcile differences between the assumed RPE and realised energy prices (via the DESNZ Industrial Energy Price Index). Uncompensated cashflow risk will be introduced in the

[253] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 23, SOC-2-0065.

scenario where energy prices remain above the price assumed by the RPE. The true-up mechanism is not an alternative to setting a realistic ex-ante RPE forecast.

341. In the FD Ofwat took "*the view that energy prices will have 'normalised' by the end of AMP8*".[254] Forecasts in energy prices differ between sources, however Ofwat's assumption-based view is not aligned with empirical evidence on how energy prices will develop over AMP8. The HMT Green Book[255] serves as a key resource for appraising policy impacts, including those related to changes in energy price for different non-domestic users. HMT publishes further supplementary tables to the Green Book to be used in policy evaluation, including forecasts on energy prices for industrial users produced by DESNZ. This forecast data series is analogous to the outturn DESNZ Industrial Price Index. It is modelling the same type of energy user in a 'known policy' world. This means it models considerable increases in renewable capacity entering the generation mix. This applies downwards pressure to forecast energy prices. The Green Book energy price forecast is therefore aligned with government policy ambition and how this will impact the non-commodity component of energy prices.

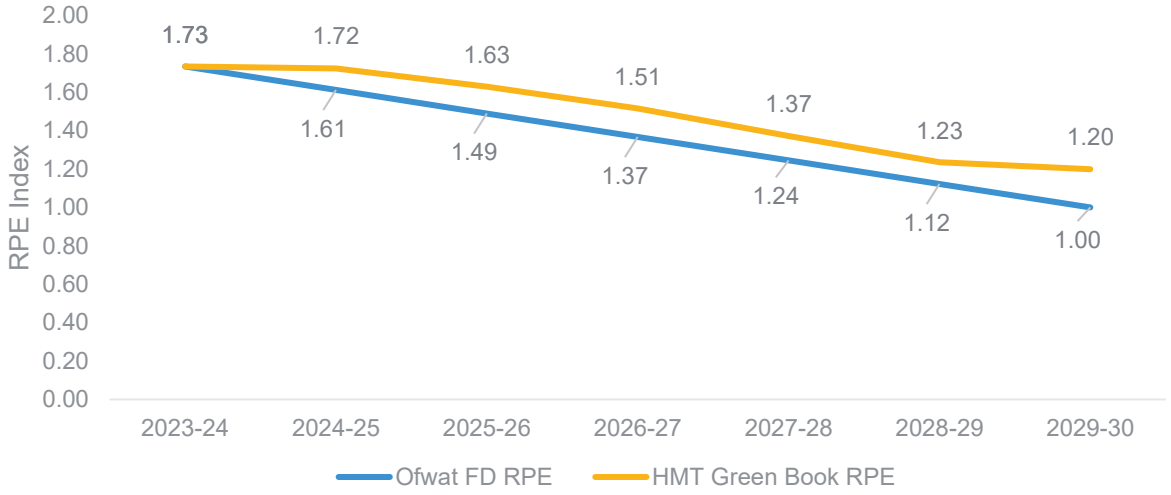
342. Ofwat's advisor CEPA has referred to the varying outlooks water companies and various externally produced forecasts have in regard to how energy prices will evolve. CEPA stated that in assuming energy prices will normalise by AMP8, Ofwat "*removes the need for the adjustment to rely on particular data points which may be subject to robustness concerns"*.[256] Ofwat's assumption-based approach has forgone the opportunity to use assured energy price forecasts produced by DESNZ (who produced the outturn index Ofwat have used for the initial uplift) to set the RPE. It is not appropriate for Ofwat to take its own assumption-based approach when reliable forecasts exist from the Government's experts.

343. The HMT Green Book energy price forecast[257] provides a close approximation to a forecast of the DESNZ outturn index. It models the same type of energy user (a non-domestic industrial user), as produced by DESNZ and is aligned with government expectations on the impact of incoming renewables policy on forecast energy prices.

344. KPMG analysis finds the HMT Green Book forecasts a slower fall in electricity prices for an industrial user than Ofwat assumed[258]. Figure 30 shows that Ofwat assumed energy prices would fall back to their pre-crisis long-term average by the end of AMP8 (i.e. an RPE index value of one). The Green Book forecasts energy prices will still be 20% above pre-crisis levels (i.e. an RPE index of 1.20)[259]. This demonstrates that Ofwat's FD RPE forecast is unrealistic when compared against a reputable data source which is aligned with government climate ambition.

[254] CEPA, December 2024, PR24 FD – Real Price Effects and the energy crisis cost adjustment mechanism, SOC-2-0040.
[255] HM Treasury, May 2024, The Green Book, SOC-2-0041.
[256] CEPA, December 2024, PR24 Final Determinations – Real Price Effects and the energy crisis cost adjustment mechanism, page 4, SOC-2-0040.
[257] Gov.uk, November 2023, Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal, SOC-2-0042.
[258] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 25, SOC-2-0065.
[259] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 25, SOC-2-0065.

Figure 30: Ofwat FD energy RPE forecast versus RPE forecast implied by HMT Green Book[260]



Source: KPMG analysis based on Department for Energy Security and Net Zero (DESNZ), November 2023, Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal, Table 4, Retail electricity price, Industrial user

345. By employing a more extreme forecast in the Energy RPE than the HMT Green Book assumption, Ofwat assumed a lower energy adjustment than will actually be required. Table 22 and Table 23 below set out the increase in the energy adjustment that would be required based on the more realistic HMT forecast. KPMG estimate that this leads to a £12.1m increase in the wholesale water adjustment and £28.5m increase in the wastewater network plus adjustment[261]. Ultimately given the end-of-period true up, a further adjustment will be made at a later date to account for an incorrect Ofwat energy price forecast. However this represents an uncompensated cashflow risk for water companies in the meantime, and can lead to unnecessary bill shock for consumers.

Table 25: Wholesale water - Impact of energy adjustment RPE (2022/23 prices, £m)

	Wholesale water (£m 2022/23)					
	2025-26	2026-27	2027-28	2028-29	2029-30	Total
Energy adjustment - Ofwat RPE	8.1	6.1	4.1	2.1	0.0	20.3
Energy adjustment - HMT Green Book Industrial user RPE	10.4	8.6	6.2	3.9	3.4	32.4
Difference	**2.3**	**2.5**	**2.1**	**1.9**	**3.4**	**12.1**

Source: KPMG analysis[262]

[260] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 25, SOC-2-0065.
[261] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 26, SOC-2-0065.
[262] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 26, SOC-2-0065.

Table 26: Wastewater network plus - Impact of energy adjustment RPE (2022 prices, £m)

	Wastewater network plus (£m 2022/23)					
	2025-26	2026-27	2027-28	2028-29	2029-30	Total
Energy adjustment - Ofwat RPE	18.9	14.3	9.6	4.8	0.0	47.7
Energy adjustment - HMT Green Book Industrial user RPE	24.3	20.1	14.6	9.3	7.9	76.2
Difference	5.4	5.8	5.0	4.4	7.9	28.5

Source: KPMG analysis[263]

Required Remedy

346. We request that the CMA agree to using the extended time series spanning from 2011/12 to 2023/24 to re-estimate our power cost share assumption given the unique circumstances arising from our hedged position in 2021. The updated assumption should then be used to re-estimate our AMP8 energy allowance estimated within Ofwat's PR24 energy adjustment model.[264]

347. This results in an increase in our implicit AMP8 power cost allowance of £17.9m in the wholesale water and £7.1m in the wastewater network plus price controls (prior to the application of the energy adjustment). Following this update, the value of the energy adjustment applied to our base allowances increases by £4.4m in wholesale water and £1.7m in wastewater network plus. This totals to an overall £22.3m and £8.8 increase in our implicit AMP8 power cost allowance in the wholesale water and wastewater network plus price controls, respectively.

348. We also request the CMA to amend the Energy RPE forecast to be consistent with the HMT Green Book energy price forecast. Amending the energy adjustment to use the most realistic and reliable forecast prevents the need for an unnecessary true-up at a later date. This will ensure that water companies do not have unnecessary and uncompensated cashflow risks prior to this true-up and customers do not face bill shock issues. This will also align the Energy RPE forecast to government ambition on renewable generation. This change to the forecast used in the Energy RPE forecast will increase our energy adjustment by £12.1m in the water price control and £28.5m in the wastewater price control.

[263] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 26, SOC-2-0065.
[264] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, page 26, SOC-2-0065.

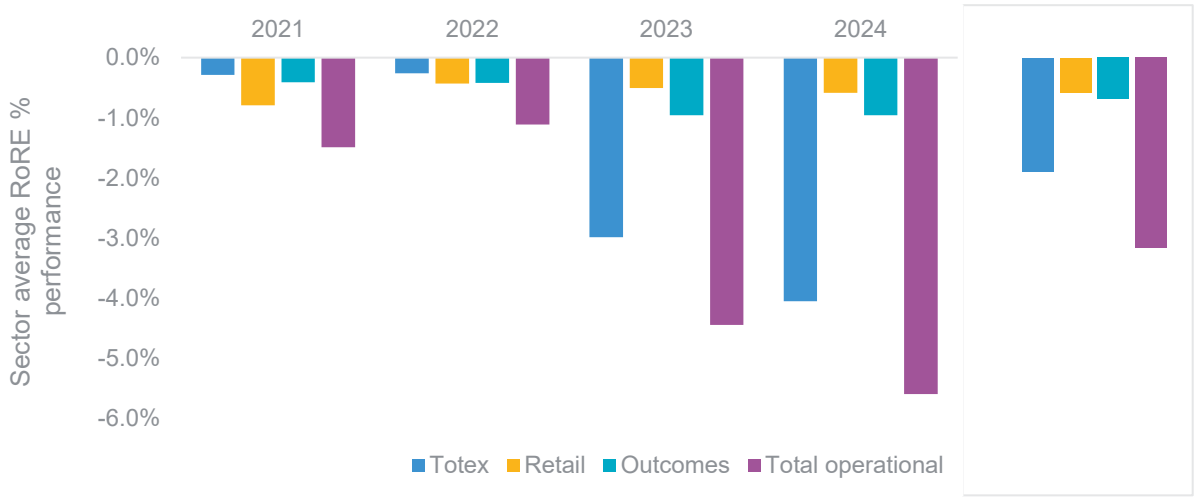
4.1.3. Error 8: Asset health - Ofwat's overall approach to funding capital maintenance through a base allowance set based on historical spend levels is not fit-for-purpose

The issue

349. Water companies are asset intensive and complex organisations that own and operate many different assets above and below ground. Capital maintenance expenditure is a significant part of the base cost requirements. The scope of modelled base costs for FD includes operating expenditure and capital maintenance expenditure. Ofwat in the FD stated that it expects "*companies to continue to maintain and improve asset health from base expenditure allowances going forward*".[265]

350. In assessing AMP7 performance, on average, companies have overspent their totex allowances and largely missed their performance commitment levels incurring net penalties every year in AMP7. Figure 31 below shows sector average operational performance in Return on Regulated Equity (RoRE) terms in first four years of AMP7 data. On average, the sector has underperformed -5.6% RoRE across all operational categories (Totex, ODIs and retail) in the first four years of AMP7.

Figure 31: Sector average AMP7 RoRE (%) performance, FY21-FY24[266]



Note: Bar chart comparing the RoRE in-year from FY 2021-2024 to the average over the AMP7 period by operational category, highlighting consistent sector underperformance.

351. In line with the overall sector, we have significantly overspent our totex allowances in AMP7. In Wholesale Water, we are projected to spend over £1.5bn on wholesale water, compared to our PR19 allowance of £852m (an overspend of more than 80%). Similarly in wastewater network plus we are projected to spend over £2.9bn, compared to an allowance of £2.0bn (an overspend of more than 45%). This spend has been required to meet the capital maintenance needs that arose in AMP7.

352. Simultaneous overspend of cost allowances and underperformance compared with performance commitments suggest that Ofwat's PR19 base cost allowances were insufficient for level of service stretch embedded in the regulatory package. Despite this, Ofwat in PR24 FD recognised that

[265] Ofwat, February 2025, PR24 FD Expenditure allowances, page 81, SOC-1-0006.
[266] Southern Water, Error 8 - Asset health, worksheet "AMP7 RoRE Summary ", SOC-2-0073.

"asset health metrics (e.g. mains repairs; unplanned outage; sewer collapses) show a stable or improving trend over time".[267]

353. Cost models based on historical data only will provide insufficient allowances to meet increasing capital maintenance needs in the future. Increasing requirements for capital maintenance expenditure in the future are mainly due to increasing standards (which require new technology and advanced treatment processes), predicted asset deterioration and growth in the asset base. Many of the new processes for water, wastewater and sludge treatment use advanced technology[268] to meet more stringent standards, which are generally short to medium life assets with more intensive energy and chemical needs. The increasing pressure of climate change also increases demand on asset performance.

354. Despite Ofwat initiating a process to understand more about sector wide asset condition issues during the AMP, it has provided no reassurances that funding is attainable. This is in contrast with the gated allowance that has been provided for Thames Water for capital maintenance. We face equivalent issues and we require a similar allowance that can be accessed as evidence of confirmed asset health issues is provided.

355. Future capital maintenance requirements are a great concern for water companies. Factors such as population growth; climate change; increasing operational resilience standards; new and increasing environmental and water quality obligations (including the legal requirement to achieve net zero carbon emission by 2050), and improving service levels to customers, may put more strain on assets and their maintenance in AMP8 compared to the past. Ofwat has not taken this fully into account.

Summary of previous representations

356. In our DD Response, we explained that the proposed base costs allowances are insufficient and place intolerable risk on the statutory and mandatory services, which its asset base is required to deliver to customers and to protect the environment. As part of our DD Response, we provided updated evidence on our base costs requirements, raised concerns specifically with the capital maintenance of our assets and proposed a remedy to the gap created between the top-down economic models and our October Business Plan submission. The analysis presented indicated a need for an additional £74m increase to reach the sustainable base maintenance level.

357. Three other companies (Northumbrian Water, Yorkshire Water, Wessex Water) submitted forward-looking capital maintenance cost adjustment claims after the DD which also requested a step-up in capital maintenance over the 2025-30 period that they do not think are reflected in base expenditure allowances.

358. Ofwat did not accept any of these claims for capital maintenance funding, citing the following reasons:[269]

a) Ofwat argued that the companies do not present any company specific issues that underpin the claims or can point to any other factors outside of company control that means future capital maintenance requirements will be higher than in the past. As a result, the step change in capital maintenance may be for asset renewals and refurbishment that these companies should have delivered with base expenditure allowances in previous regulatory periods.
b) Ofwat argue that the outputs from the proposed cost adjustment claims are unclear. This means it would be difficult if not impossible to hold the companies to account for delivery of additional outputs or improvements in asset health outcomes.

[267] Ofwat, February 2025, PR24 FD Expenditure allowances, page 81, SOC-1-0006.
[268] See Error 3 above for details of the advanced anaerobic digestion (AAD) technology solution at sludge treatment centres
[269] Ofwat, February 2025, PR24 FD Expenditure allowances, page 82, SOC-1-0006.

c) Ofwat argued that an additional capital maintenance allowance could disincentivise companies from undertaking asset renewals with base expenditure allowances going forward.

359. Although Ofwat rejected claims to increase capital maintenance funding in AMP8, it recognised the uncertainty related to actual expenditure requirements to meet asset health targets. Ofwat in the FD set out a high-level process for how additional base expenditure allowances can potentially be provided either in-period or through the PR24 end-of-period reconciliation if any sector wide asset condition issues identified are material. However, crucially there is no certainty around either the scale or timing of any potential allowances, despite this spend being required from the start of the AMP to address immediate asset health issues.

Ofwat's PR24 approach to capital maintenance is not fit for purpose

360. A characteristic of water and wastewater infrastructure is that it has long-lived assets. As a result, companies may be in an asset maintenance 'peak' or 'trough' at different times. This is problematic for setting the efficient level of future capital maintenance expenditure, which is less correlated with the amount spent in the most recent periods. The consequences of not investing in the long term can be extreme and very costly e.g., in instances of asset failure.

361. In the FD, Ofwat recognised the difficulty of assessing capital maintenance requirements going forward. Ofwat said that the absence of robust asset condition and workload data "*poses some difficulty when assessing what companies have delivered historically through base allowances, and consequently what base buys going forwards".*[270]

362. Ofwat's PR24 approach to capital maintenance lacks a forward-looking element, e.g., there is neither a cost driver included in the econometric models which could reflect future trends in capital maintenance requirements, nor is forecast data used to estimate model coefficients. Backward-looking methods assume that the past is representative of the future. These methods can be a useful starting point to understand historical trends in capital maintenance and typical expenditure requirements. However, they are not well suited to consider the 'effective health' of our asset base, namely, condition, age and performance or the 'efficient' future investment profile for our asset base. Deterioration modelling, and performance trends predict that Southern Water are facing a once in a generation peak in capital maintenance requirements in AMP8. This has not been accounted for in Ofwat's modelling.

363. In the FD, Ofwat applied two sector wide capital maintenance cost adjustments to allow companies to renew more water mains and meters than they are funded to deliver through the base cost models. These adjustments have been made to address asset condition issues. This indicates that Ofwat implicitly accepted that an approach to funding capital maintenance through the base models alone is no longer fit for purpose and could not compensate the sector for increasing capital maintenance needs in AMP8. Whilst it has only provided an adjustment for two specific areas – this is due to it being unable to conduct a full industry-wide assessment for other areas at this stage.

We have needed to overspend our allowance for the wholesale water price control over multiple AMPs to maintain our asset base

364. Since PR04, we have requested additional base expenditure to ensure we were able to maintain sufficient asset health across our wholesale water network. The requests for additional base expenditure over these historical price reviews were based on Pioneer, our asset deterioration modelling tool, which forecasts and costs the necessary interventions to maintain and restore asset

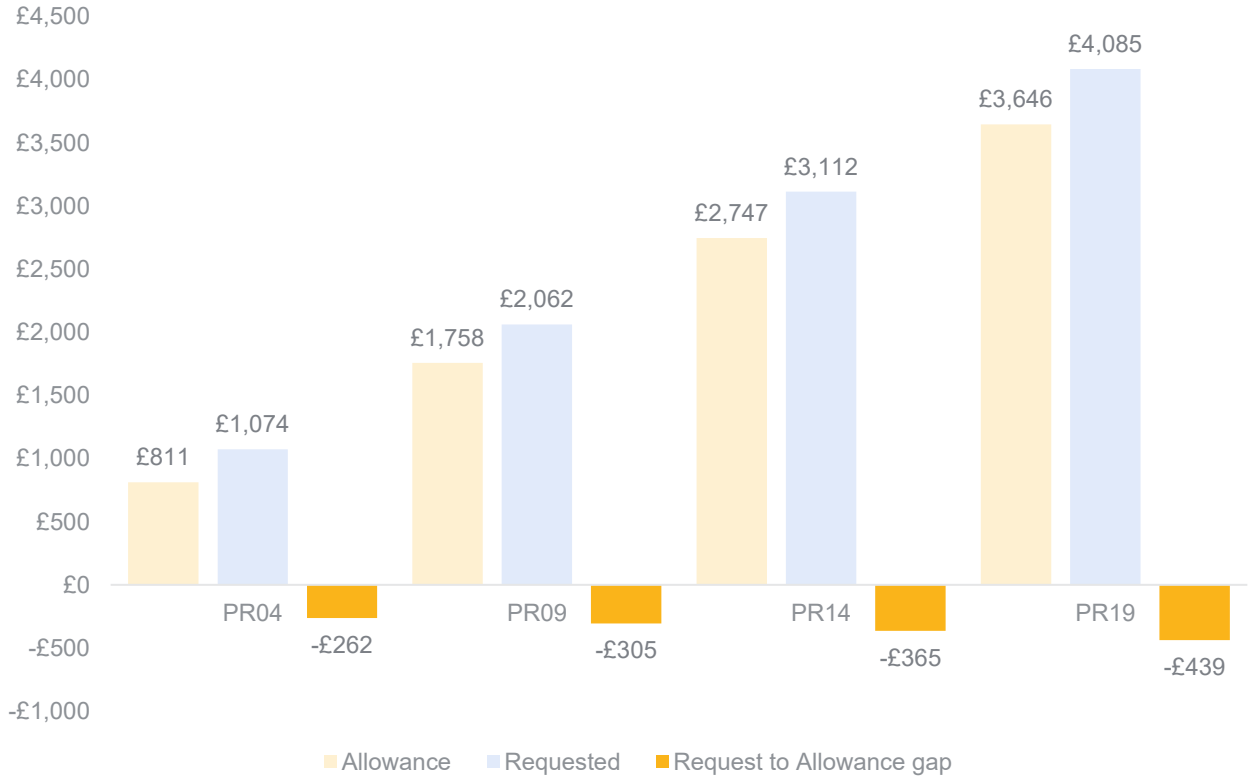
[270] Ofwat, February 2025, PR24 FD Expenditure allowances, page 90, SOC-1-0006.

health.

365. Our Pioneer deterioration models are based on the Common Framework for Capital Maintenance[271] which is an agreed framework for estimating future capital maintenance requirements. The framework was developed by UK Water Industry Research (**UKWIR**) in collaboration with Ofwat, the Drinking Water Inspectorate, the Environment Agency, DEFRA and the Water Companies. It provided an agreed basis for estimating the future capital maintenance requirements to achieve a defined level of service for customers and the environment in the most cost-effective manner in the long-term, and the basis for Southern Water's past and present base cost allowance requests at Price Reviews.

366. However, at each price review, Ofwat has provided us with an expenditure allowance substantively below our requested expenditure for the wholesale water asset base. This difference between can be seen in Figure 32. Over the four price controls we cumulatively were provided with £439m less expenditure than requested for wholesale water.

Figure 32: Cumulative Business Plan request and base expenditure allowance for wholesale water price controls, PR04 – PR19 (£m)



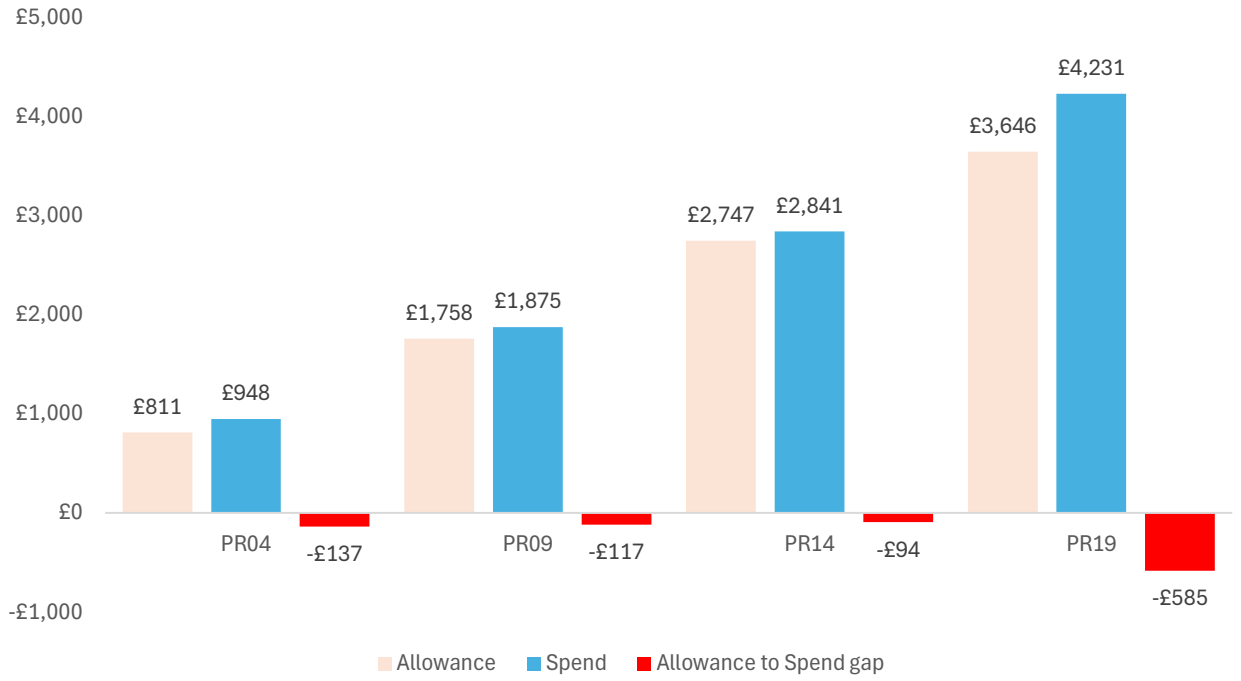
Note: Southern Water analysis[272]

367. Whilst we have not appealed these determinations, it has been necessary to spend more than was provided for by Ofwat to meet our statutory duties to maintain our assets and improve performance.

[271] UKWIR, Capital Maintenance Planning A Common Framework Volume 1 Overview, SOC-2-0062.
[272] Southern Water, Error 8 - Asset health, worksheet "SRN – Allowance vs spend", SOC-2-0073.

Figure 33 shows the cumulative gap between allowed expenditure and actual expenditure, as we needed to spend closer to the amounts originally requested to maintain asset health over those periods. In fact, by the end of AMP7, we will have spent £200m more than requested on our wholesale water asset base over the course of the four AMPs, which is £585m more than allowed for by Ofwat. This level of spend beyond our allowances is not sustainable.

Figure 33: Cumulative base expenditure allowance and actual expenditure for wholesale water price controls, PR04 – PR19 (£m)



Note: Southern Water analysis[273]

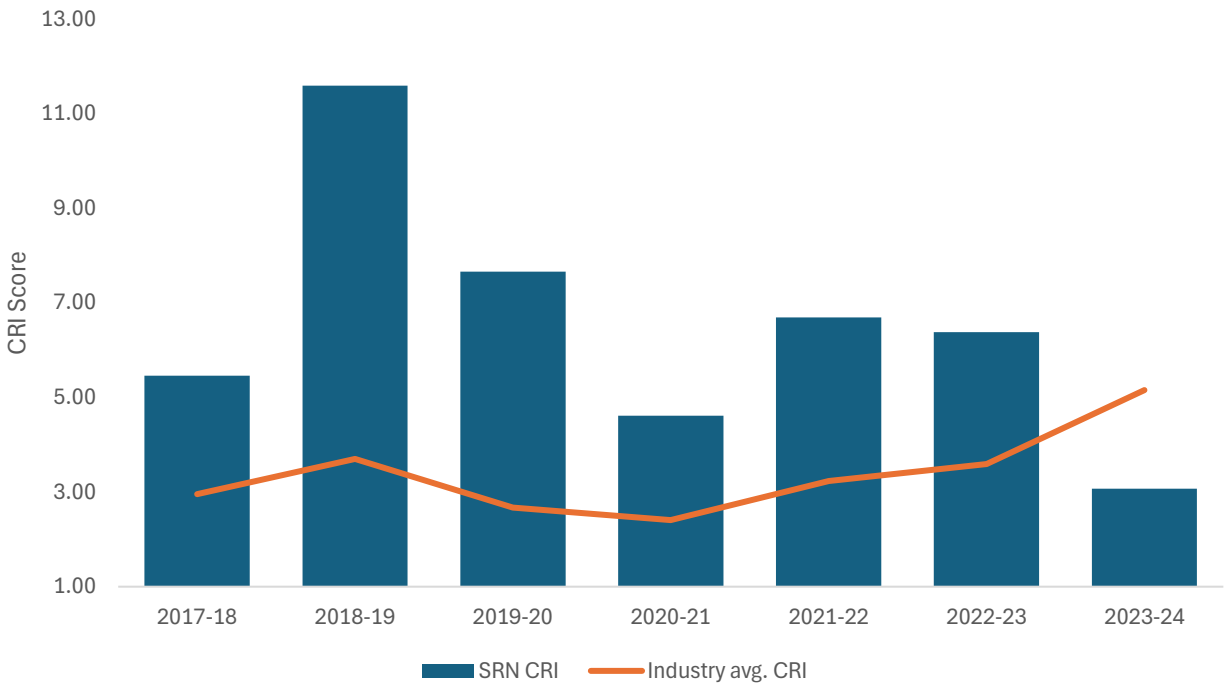
368. Despite spending more than was allowed from 2005 - 2015, a deterioration of performance occurred in AMP6 and this was a symptom of not having a sufficient base cost allowance. This deterioration can be seen in the Compliance Risk Index (CRI)[274] score which increased to 11.59 in 2018/19, significantly more than the industry average of 3.70.

369. In response to these performance issues, we invested significantly more than our allowances in subsequent years to improve performance. We also took proactive steps from 2017 onwards to identify the emerging asset risks through investigative asset studies in our Hazard Review ('**Hazrev**') programme. This programme of investigative work allowed us to further understand and quantify asset risk. The introduction of the Hazrev programme gave us more granularity in understanding its asset health and interventions to improve performance. This investment has led to a beneficial improvement in performance for CRI and other water quality indicators in AMP7, with CRI improving from 11.59 in 2018/19 to 3.04 in 2023/14, significantly below the industry average.

[273] Southern Water, Error 8 - Asset health, tab "SRN – Allowance vs spend", SOC-2-0073.
[274] The Compliance Risk Index (CRI) score is a performance measure that assesses compliance across the water companies operating in England and Wales based on regulated water quality parameters in the Water Supply (Water Quality) Regulations 2016 (as amended) [England] and 2018 [Wales]. More details can be found at DWI, Indicative Compliance Risk Index England and Wales, SOC-2-0063.

370. Figure 34 below compares our CRI score to the industry average from 2017/18 to 2023/24

Figure 34: Southern's Compliance Risk Index (CRI) annual score compared to industry average, 2017/18 -2023/24

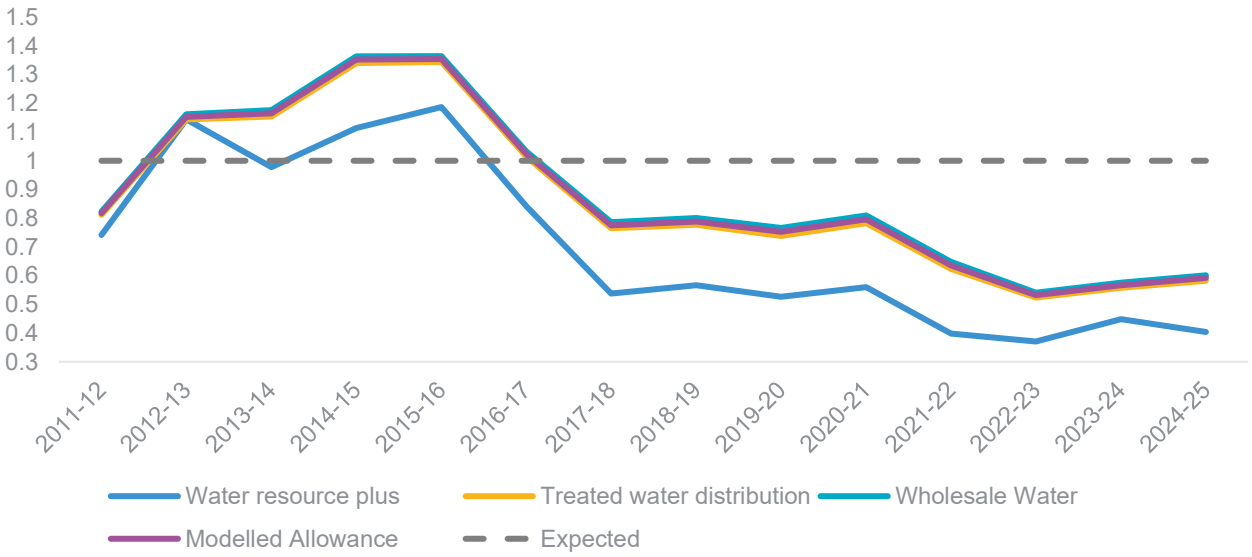


Note: Southern Water analysis[275]

371. When reviewing Ofwat's PR24 models across the entire modelling period since 2011, it is evident that our modelled allowances for the wholesale water price control would have been insufficient to cover the amount that needed to be spent historically. Moreover, the difference between the modelled allowances and the actual amount spent has been increasing year-on-year. This is the case irrespective of whether one looks at a model for a specific level of cost aggregation or at the overall wholesale water modelled allowance. Figure 35 shows how the shortfall between what has been allowed for by Ofwat's PR24 models and what needed to be spent has been increasing over time.

[275] Southern Water, Error 8 - Asset health, worksheet "SRN – Allowance vs spend", SOC-2-0073.

Figure 35: Southern Water's modelled allowance for wholesale water price control as a proportion of actual spend, 2011 - 2030

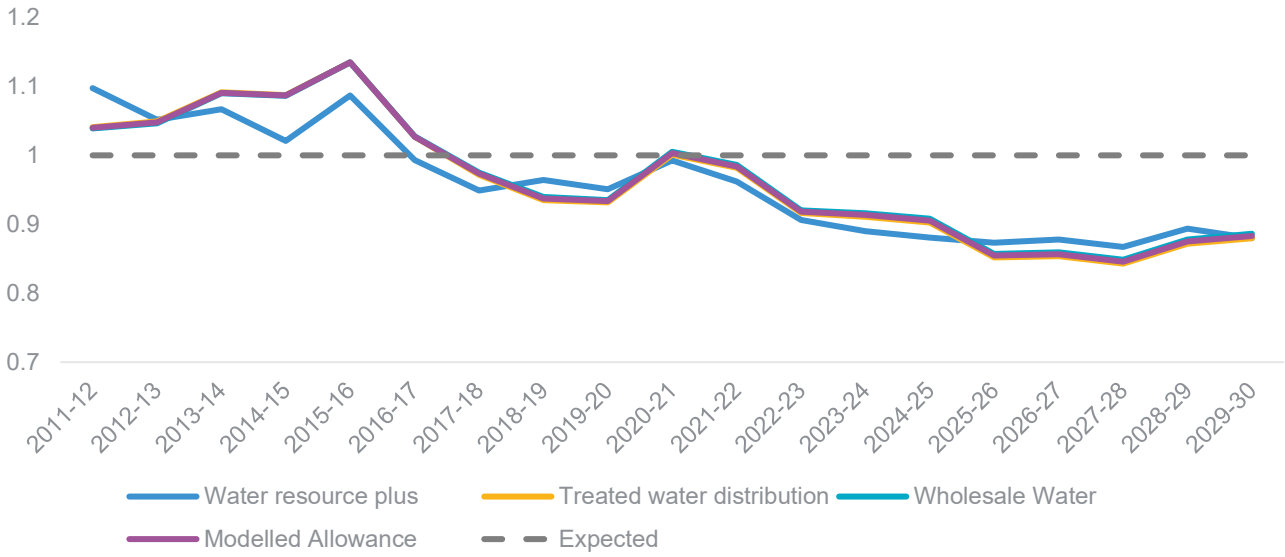


Source: Southern Water Analysis of Ofwat's PR24 models[276]

372. If this long-term trend of increasingly insufficient allowances was only apparent for one company, it could be possible for Ofwat to argue that it was due to cost inefficiency. However, the same trend is evident at the sector level. This implies a structural issue in the models which are not appropriately capturing necessary industry spend. Figure 36 shows the difference between what Ofwat's PR24 models allow for and what the industry has needed to spend on its wholesale water assets. It is clear that Ofwat's models do not reflect the level of spend that has in fact been required across the industry.

[276] Southern Water, Error 8 - Asset health, worksheet "Sector wide – Allowance vs spend", SOC-2-0073.

Figure 36: Sector-wide modelled allowance for wholesale water price control as a proportion of actual spend, 2011 – 2030



Source: Southern Water Analysis of Ofwat's PR24 models[277]

Our forward-looking asset deterioration modelling forecasts significantly more spend for our wholesale water assets in AMP8 than Ofwat has allowed for

373. In line with previous AMPs, Pioneer is forecasting significantly higher spend requirements in AMP8 than provided for by Ofwat's allowance. Pioneer has continuously predicted that there will be a peak in investment from AMP7 onwards, owed to the stock of assets reaching the end of their useful life. The Pioneer modelling is based on maintaining stable performance (water quality, interruptions to supply and bursts) across the below ground and above ground asset classes. This is consistent with the approach taken in previous price reviews and aligns to the principles of the common framework.

374. Despite the investment made in recent years above our expenditure allowance, overall asset age has continued to increase, as demonstrated in Table 24 by the change in average asset life from Pioneer, compared to previous price review assessments. This underlines the need for further capital maintenance spend in AMP8.

[277] Southern Water, Error 8 - Asset health, worksheet "Sector wide – Allowance vs spend", SOC-2-0073.

Table 27: Pioneer average asset effective age

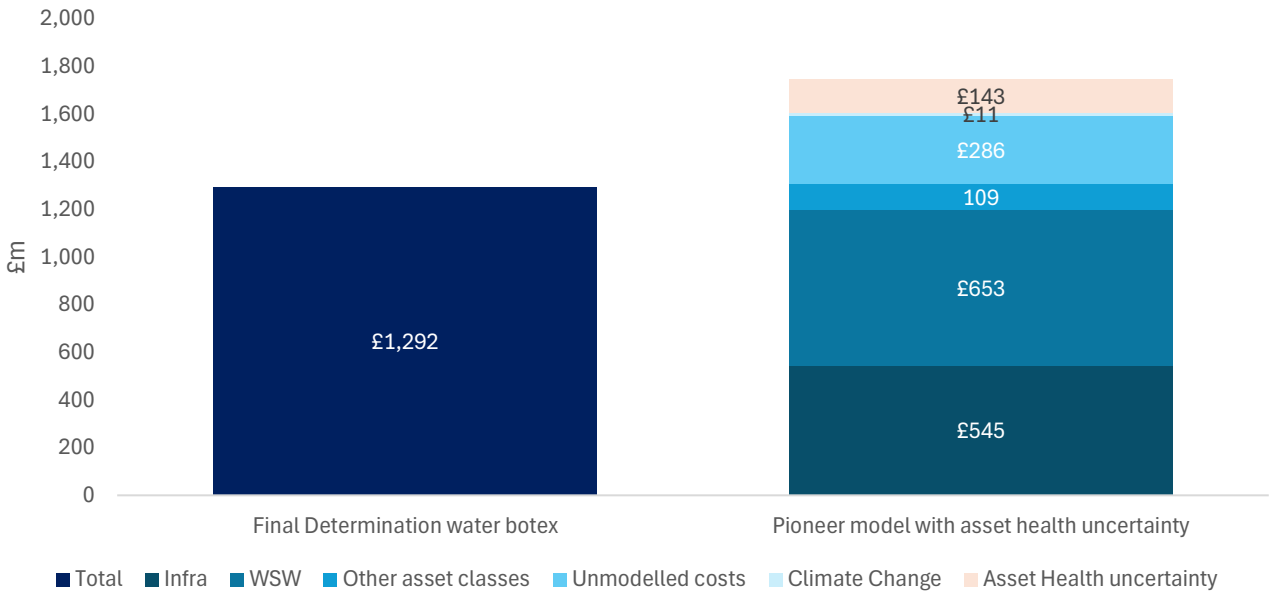
		PR14	PR19	PR24
Infra	Average	66.1	67.6	71.0
Non-Infra	Average	14.5	16.0	19.5
	10 Year lifespan assets	11.6	12.1	17.3
	11 - 20 Year lifespan assets	9.5	10.9	15.7
	21 - 30 Year lifespan assets	15.2	15.6	20.0
	31 Year + lifespan assets	20.2	33.9	40.0

Source: Pioneer model

375. The results of our latest Pioneer modelling for our wholesale water asset base are shown in Figure 37. This shows an increase from our FD allowance of £1.29bn to a new required spend on wholesale water assets of between £1.59bn and £1.74bn. This is above the original wholesale water requested amount of £1.43bn. This estimate reflects the latest modelled view of the requirements of the water asset base, and the level of uncertainty pending further asset health surveys planned for AMP8. As explained in our DD Response, we have continued to develop and strengthen our Asset Risk Management tools which underpin our Botex plan, maturing our approach to Asset Health.[278] In AMP8 we intend to deepen our understanding of the condition and health of our asset base and are continually seeking to mature our asset management approach and the impact it could have on AMP8 investment.

[278] Southern Water, August 2024, SRN-DDR-021: Sustainable Botex Technical Annex Draft Determination Response, page 6, SOC-2-0064.

Figure 37: Wholesale water base cost requirements in AMP8



Source: Southern Water Analysis[279]

376. The modelling assumptions for the contributing factors to the Pioneer investment profile set out in Table 27.

Table 28: Modelling assumptions for Wholesale water base cost requirements in AMP8

Expenditure Area	Justification
Infra	As modelled by Pioneer
WSW	As modelled by Pioneer
Other asset classes	As modelled by Pioneer
Unmodelled cost	Unmodelled costs that are assessed as base costs as per DDR, but not accounted for in Pioneer (e.g. business rates, traffic management act pension deficit)
Climate Change	Accounting for impact of climate change, additional 0.7% of Water Base expenditure added as per the allowance in Water – Resilience: Enhancement expenditure
Asset Health Uncertainty	Calculated value based on potential risk of investment needed to be brought forward from AMP9 to address emerging asset health risks, to reflect the uncertainty in the underlying asset health data. This value is a based on the proportion of the water asset base for which there is less recent condition survey data to evidence the future investment needs.

[279] Southern Water, Error 8 - Asset health, worksheet "Base cos adj. asset health", SOC-2-0073.

Ofwat's PR24 approach to capital maintenance does not reflect recommendations made by the CMA in the CMA PR19 Redetermination

377. Ofwat's approach to base costs at PR24 is an evolution of its PR19 approach. At PR19, Ofwat used econometric models to assess 'base costs plus', which include capital maintenance. The assessment was based on historical costs and was supplemented by an adjustment process, mainly through the examination of 'cost adjustment claims'. Ofwat's assessment did not include a systematic consideration of future capital maintenance requirements. Several companies raised cost adjustment claims due to "lumpy" capital maintenance costs at AMP7. Ofwat rejected the base element of these claims, stating that modelled base allowances are long-term efficient and companies need to manage peaks and troughs in routine investment within this long-term based allowance.

378. The CMA adopted Ofwat's approach to dealing with capital maintenance in the CMA PR19 Redetermination and rejected Anglian Water's 'capital maintenance' claim. However, the CMA provided a recommendation to Ofwat as follows: *"We acknowledge Anglian's and Northumbrian's argument that Ofwat's cost assessment is backward looking and that potential issues with capital maintenance may be forward looking. This is a complex issue, which, going forward, may become more important. We therefore suggest that Ofwat considers developing indicators to track this issue and to enable it to enhance its analysis with a forward-looking element that will assist in triangulating results from its econometric modelling of historic costs".*[280]

379. Ofwat has not acted on the CMA recommendation to enhance its approach to capital maintenance with a forward-looking element. PR24 base allowances, including capital maintenance, are determined based on historical data only and do not reflect any forward-looking element of capital maintenance against the recommendation of the CMA.

380. Using forecast data in cost assessment to set future efficient allowances is common regulatory practice. Forecast data can be helpful to inform appropriate allowances, particularly where the past is not a good guide to the future. Ofwat used forecast data at PR19 and combination of historical and forecast data at PR24 to assess enhancement costs. Despite these precedents, Ofwat has chosen not to use any forward-looking information when setting base cost allowances at PR24 – going against the CMA's recommendation from the CMA PR19 Redetermination. Ofgem at RIIO-2 used a combination of historical and forecast data its totex models to account for the fact that historic spend may not be the best basis to determine future spend. Ofgem explained that "*capturing forecast data ensures that cost pressures are captured".*[281]

Ofwat's decision to reject Southern's cost adjustment claims on capital maintenance is inconsistent with the company-specific approach taken for Thames Water in PR24 FD.

381. Ofwat recognising the need for and providing higher capital maintenance allowances at PR24 is inconsistent with the company-specific approach taken with Thames' gated allowance provided in PR24 to improve performance on its assets beyond historical levels.

382. Ofwat rejected our claim for capital maintenance funding on the basis of insufficient evidence. At the same time, Ofwat has allowed an asset improvement gated allowance for Thames Water where Ofwat considered *"Thames Water's proposals and estimates did not provide a reliable basis on which to provide additional allowances, due to insufficient evidence of need, a lack of optioneering*

[280] CMA, March 2021, Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations, page 185, para 4.293, SOC-2-0009.
[281] Ofgem, February 2021, RIIO-2 FD – GD Sector Annex (REVISED), page 109, SOC-2-0026.

and evidence of cost efficiency".[282] It is inconsistent for one company to receive a gated allowance to allow it to develop sufficient evidence to access funding, whilst another company has its funding request rejected completely in analogous circumstances.

383. In the DD we already identified specific asset health issues that require capital maintenance which will not be funded through the base allowance. In our DD Response, we identified three specific areas[283] where additional funding is needed:[284]

a) Water service reservoirs (additional £14m) – to address escalating costs and compliance risks identified from ageing asset base.
b) Wastewater rising mains (additional £30m) – asset health data details an increased investment need due to premature failure of rising mains. Additional investment required to deliver pollution performance improvements.
c) Wastewater pumping stations (additional £30m) – asset health data details an increased investment need due to ageing asset stock. Additional investment required to deliver pollution performance improvements.

384. Ofwat scrutinised the evidence related to these claims, in the same way that it has scrutinised the evidence related to Thames Water's request for additional allowance for capital maintenance. We do not disagree with Ofwat's view that the evidence base can be further strengthened. However, whilst Thames Water was subsequently afforded an opportunity to further develop the evidence base and access allocated funding - we have not.

385. Ofwat should have allowed a similar expenditure allowance for Southern Water during AMP8 for capital maintenance which can accessed through an equally rigorous gating process for each individual workstream.

Ofwat has erred in not addressing capital maintenance issues comprehensively as part of PR24

386. Ofwat has not acted on the CMA recommendations from PR19 to enhance its approach to capital maintenance with a forward-looking element. Instead, it has relied on its historical base cost modelling as the typical funding approach for capital maintenance.

387. Ofwat has acknowledged that this historical approach is not going to be sufficient in every area and has provided some additional allowances for capital maintenance. It made sector-wide adjustments in two areas where it considers evidence is robust and allowed Thames Water alone to access its own unique gated allowance for capital maintenance for areas where it considers evidence is not robust. This piece-meal approach means that Southern Water, in line with other water companies, will still have the majority of its capital maintenance needs being met based on historical spend rather than forward-looking elements.

388. Ofwat has only now initiated a process to understand more about asset health across the industry and intends to develop its thinking in this area.[285] However the mechanism is unclear and uncertain. Crucially we have no certainty whether additional funding will be made available and

[282]Ofwat, December 2024, PR24 FD: Expenditure allowances - Thames Water gated allowance appendix, page 4, SOC-2-0043.
[283] As part of our work reviewing our asset portfolio, further work will be identified.
[284] Southern Water, August 2024, Our response to Ofwat's draft determination on our Business Plan for 2025–30, page 61, SOC-2-0002.
[285] Ofwat, December 2024, PR24 FD: Expenditure allowances – base cost modelling decision appendix, pages 91 - 94, SOC-2-0001.

when this could be made available. It is also unclear how Ofwat would deal with the situation where evidence was presented of asset health issues for one company but there was no compelling evidence of sector-wide issues.

389. We require immediate funding for asset health issues. Our Pioneer asset deterioration modelling now forecasts up to an additional £300m of spend on our wholesale water assets, beyond that requested originally in our DD Response. In the DD, we identified three specific areas where additional funding was required, including £60m within wastewater assets. We have not yet quantified the asset health requirements across the remainder of our wastewater asset base This required spend may increase further as we deepen our understanding of the health of our asset base. However, Ofwat has not provided us with a mechanism for accessing an additional allowance. This error from Ofwat means that there is a greater risk that capital maintenance does not happen at the efficient level during AMP8 as the overall base cost allowance is insufficient to fund it.

Required Remedy

390. We request that the CMA provides a distinct expenditure allowance for Southern Water that can accessed in-period as evidence is provided. We expect the process to accessing this allowance to be through a gated process for each individual workstream similar to the approach taken for Thames Water in the FD. We request a gated allowance of up to £500m that can be accessed during AMP8 when specific asset health issues are identified with either wastewater or water assets.

391. This remedy would protect customers and the environmental long-term interests, ensuring that essential capital maintenance can be delivered promptly once an issue is identified. It will also ensure that funding is only provided once there is robust evidence of an asset health issue, thus ensuring that customer bills are not inflated needlessly. The remedy would also ensure that funding would be available where evidence was presented of asset health issues for one company but there was no compelling evidence of sector-wide issues

392. This remedy would also give Southern Water confidence that when it can evidence specific asset health issues, there is a clear route to getting funding to rectify these. Ofwat's current approach to understand more about asset health does not give us this confidence. This will allow us to conduct thorough investigations into understanding the detailed asset health issues across the network.

Chapter 3
Enhancement Expenditure Allowances

1. Executive Summary

1. Enhancements are improvements to assets and services to meet new standards or statutory requirements as well as activities to provide services to new customers. There is a step change in enhancement investment required for AMP8. **The FD cost allowance for the PR24 enhancement programme is over five times the allowance for the PR19 (AMP7) enhancement programme**. Most enhancement projects are driven by environmental statutory and regulatory requirements.

1.1 Errors

2. We were asked by Ofwat to provide fully costed project assessments. We are disappointed that in so many instances, Ofwat did not engage with the data that was requested and rather applied abbreviated or arbitrary assessments which resulted in significant funding shortfalls or misallocation of enhancement funding to base costs – without any substantive engagement with or rebuttal of the evidence provided.

3. The resulting level of the funding shortfall, comparing the abbreviated Ofwat approach with the fully costed projects, for Southern Water, is approximately £300 million. This is a material amount that cannot simply be accommodated by squeezing our base costs harder. £300 million is equivalent to 8% of Ofwat's allowed base funding for all water, wastewater and bioresources services.

Table 1: Cost deductions included in this enhancement case

Ofwat error	Enhancement category	Schemes / Programmes	Impact: £m gap
Error 1: Setting cost allowances based on weakly performing top-down models that have not accounted for the full complexities of our enhancement programme	Water supply interconnectors	1. Hampshire Grid – Andover Link Main 2. Hampshire Grid – Southampton Link Main	20.2
	Bioresources Industrial Emissions Directive	1. Secondary containment at all 16 sites requiring IED improvements 2. "Other IED" costs relating to all 16 sites	33.6
Error 2: Applying arbitrary top-down challenges without sufficiently engaging with our bottom-up costs.	WINEP flow monitoring at sewage treatment works	All 254 treatment works with AMP8 WINEP requirements for flow monitoring improvements	21.0
	WINEP monitoring at emergency overflows	All 251 emergency overflow sites in the AMP8 WINEP requirements to install Event Duration Monitoring and flow monitoring.	27.9
	WINEP - Water	All investments required to address statutory requirements: 1. Invasive non-native species (£5.0m) 2. Drinking water protected areas (£22.8m) 3. Water Framework Directive (£8.2m)	3.6

	Wastewater shallow dives	All investments required to address statutory requirements: 1. Event Duration Monitoring (£8.3m) 2. Nature based solutions for sanitary parameters and P removal at 3 sites (£13.5m) 3. Microbiological treatment at 6 sites (£40.7m) 4. Budds Farm Havant SSO storm overflow scheme (£48m)	10.2[1]
Error 3: Incorrectly reallocating enhancement expenditure to base or incorrectly determining that enhancement expenditure has been funded previously	Mains replacement	Programme of 366km of mains replacement, 66km of which target asset health and 300km target leakage reduction.	106.8
	Water resilience	1. [redacted]WSW transition funding 2. [redacted]WSW transition funding 3. Weir Wood WSW transition funding	59.7
	Water supply scheme	Smock Alley	21.3
	Total		304.3

4. The FD provides inadequate enhancement allowances for a number of schemes by reason of:

i. **Error 1: Setting cost allowances based on weakly performing top-down models that have not accounted for the full complexities of our enhancement programme**. For the purposes of the FD, Ofwat determined material enhancement allowances by reference to top-down econometric models or following deep or shallow dive assessment.

For water supply interconnectors and Industrial Emissions Directive (**IED**) schemes, Ofwat relied on top-down econometric models to determine the enhancement allowance. In both cases, the models are inappropriate. They did not take into account material factors that drive differences in costs, were not statistically robust and not a credible method for assessing costs for essential and complex investment activities.

This is not a casual technicality. The shortfall in funding caused by these incorrect modelling amounts is material, where project costing was provided to Ofwat, which evidenced that our costs are efficient.

[1] This value includes a £5.4 million reduction from Ofwat's shallow dive assessments on EDM Monitoring, NTAL Monitoring, Nature-Based Solutions, Microbiological Treatment, and Fish Screens, plus a £4.8 million cut from its assessment of our Budds Farm storm overflows scheme, which applied a 10% "company level efficiency challenge". While not explicitly labelled a shallow dive, this approach aligns with the method and is treated as such.

ii. **Error 2: Applying arbitrary top-down challenges without sufficiently engaging with our bottom-up costs:** Where Ofwat has not used econometric models to determine the enhancement allowance, it applied reductions to our requested allowances following a 'deep dive' or a 'shallow dive' assessment. In many instances, the reductions are arbitrary. For example, for a statutory monitoring programme Ofwat applied a 30% reduction to our costs on the basis it had "significant concerns". Ofwat has not considered sufficiently the evidence we provided as to scheme scope and costs; and

iii. **Error 3: Incorrectly reallocating enhancement expenditure to base (i.e., proceeding on the basis that the scheme is funded by base allowances) or incorrectly determining that enhancement expenditure has been funded previously**. Ofwat has incorrectly reallocated a significant proportion of our requested enhancement allowance to base costs. One example is Ofwat's assumption that we will undertake a considerable volume of mains renewal activity, beyond what is the historical industry level, funded through our base cost allowance. We propose an extensive mains renewal enhancement programme aimed at reducing leakage. Overall, Ofwat disallowed £188 million of water enhancement costs on the basis that Ofwat considers we are implicitly funded for these activities through base cost allowances. £188 million is equivalent to a further 23% efficiency challenge to our modelled wholesale water base cost allowance. We cannot absorb the cost of these additional activities, particularly when our base cost allowance is itself inadequate (see section 7).

1.2 Impacts

5. This results in an enhancement cost allowance that is materially short of the allowance we require to deliver the mandated outputs.

6. We have reviewed Ofwat's FD and present scheme specific, material cases for Ofwat's decisions to be overturned. In total, we are seeking a redetermination that must include an additional £304 million in enhancement funding. Other components of our enhancement shortfall relate to schemes and areas where the cost gap is less material than in the nine cases listed above in Table 1. Typically, the shortfall in such schemes and programmes arises from the application by Ofwat of the same flawed approaches described below with respect to the cases for which we are requesting a redetermination. While we are not presently requesting that the CMA makes a redetermination in relation to such schemes and areas, to the extent that the CMA's investigation extends more widely into Ofwat's approach to enhancements (e.g. at the request of another Disputing Company), we reserve the right to make further submissions to the CMA in respect of such matters.

1.3 Remedies

7. We provided fully costed project assessments to Ofwat in our Business Plan. We ask the CMA to engage with our assessments and to award the necessary funding. The remedies we recommend result in an addition of £287 million to our cost allowance compared to Ofwat's FD. The specific enhancements we are asking the CMA to remedy are set out in Table 1 above.

2. The role of enhancement

2.1 What is enhancement?

8. As a water and wastewater company, our primary purpose is to provide the essential public services of delivering wholesome drinking water to our customers and taking away and treating their wastewater. We do so, knowing that our activities are intimately connected to our local environment. We take water from the environment to supply our customers, and the discharges from our wastewater collection and treatment systems are made directly to the water environment.

9. Our local rivers and coasts are under increasing pressure, with many of them (and the diverse flora and fauna they support) showing signs of decline. Under strategic guidance from the UK Government, supported by detailed guidance from the Environment Agency (**EA**), we assess how we can best minimise the impact of our activities. New requirements and standards are set by the UK Government and our quality regulators (e.g., the EA and Drinking Water Inspectorate (**DWI)**), and at each price review we set out a programme of improvements we need to make to move us from meeting today's standards to meeting the new standards and requirements as well as other improvements that are the priorities of our customers. This is our enhancement programme, the vast majority of which is to invest in non-negotiable regulatory requirements.

10. Managing our assets and activities to provide these services to today's standards and to today's customers are what is called "base" at the price review. The improvements, and extensions to our assets to provide for new customers are enhancements. To fund improvements, we would typically require one-off enhancement funding, followed by an enduring change to base costs to operate to the new standards, or to serve more customers, into the future.

2.2 How the regulatory framework treats enhancement

11. The drivers for enhancement can arise from a number of different sources. Examples include:

- External changes that mean today's assets cannot continue to meet today's standards going forward (for example deteriorating raw water quality needs new treatment processes to deliver the same high quality drinking water standards);
- Newly enacted legislation that requires changes to the way we operate our assets (for example the Storm Overflows Discharge Reduction Plan sets higher standards);
- Regulatory interpretation of the impact of existing legislation (for example the latest River Basin Management Plan which highlights where new actions are needed to play our part in restoring good ecological status in our rivers);
- Regulatory policies that set clear expectations of water companies (for example the National Framework for Water Resources and the Defra Environment Improvement Plan).
- Regulatory guidelines for long term planning that include Government Directions (for example the Water Resource Management Plan guidelines and the Drainage Water Management Plan guidelines),
- Notices and support for improvements from the DWI to upgrade assets to mitigate risks to our supplies to customers; and
- Through engaging with our customers, we listen to their priorities and propose investments needed to meet new customer priorities.

12. There are a number of regulatory frameworks underpinning some of the enhancement requirements. For example, all companies are required to produce a Water Resources Management Plan **(WRMP**)

and all wastewater companies are now required to produce a Drainage and Wastewater Management Plan (**DWMP**). Whilst WRMPs are not new, they now contain far more large strategic resource options (**SROs**) such as new reservoirs and new transfers of water, which can provide benefits to the customers of multiple water companies across regions.

13. The EA and Natural England advise companies in translating the environmental regulations into detailed individual actions we need to take to meet the environmental standards through a programme called the Water Industry National Environment Programme (**WINEP**).

14. Once the needs from all the different planning frameworks, the plans of housebuilders in our region and new regulations are clear, we complete a process of options appraisal and costing which we explain in more detail below. Our plans for enhancement investment are part of the quinquennial submission to Ofwat for consideration at each price review.

15. Ofwat typically uses comparative benchmarks to estimate efficient costs. However, since they are impacted by specific local geographical and environmental factors enhancements are often highly bespoke in nature and harder to benchmark than base activities. In such cases, Ofwat often uses an engineering 'deep dive' approach to inform its cost assessment.

16. Appropriate enhancement allowances are essential to fund the activities we need to carry out to meet new statutory obligations and deliver step changes in performance or service.

2.3 How we derive our enhancement costs

17. We employ experienced engineers with years of appropriate technical expertise in the water sector. We require appropriate professional qualifications and mandate continuing professional development to ensure our engineers remain informed of current good practices in the sector.

18. We use technical services suppliers on our professional services frameworks to help us identify and design solutions to our most complex problems.

19. We learn lessons from previous solutions that we have implemented, challenging our standards to ensure that we meet future outputs efficiently and achieve best value.

20. We use tools developed by our Cost Intelligence Team (**CIT**) to undertake our initial cost estimation. We do this at several stages throughout our option development process as the solution develops and design maturity increases. Our level 1 estimates are based on our historical cost data, gathered from delivering past projects and informed by industry benchmark costs held by our CIT suppliers. Our level 2 estimates are based on a more robust understanding of scope, where we have developed greater detail about the works we need to undertake to construct an asset or implement an intervention. Our level 3 costs are based on quotes provided by our suppliers and delivery partners. These are quotes from the market and are therefore independent of our historical cost curves.

21. We use our CIT to benchmark our project cost estimates, ensuring they are appropriately tested against the delivery costs of our peers for equivalent scope.

22. We obtain independent third-party cost assurance for our most complex and high-profile projects to ensure that our costs are appropriate and provide value for money.

23. As part of our DD Response, we submitted additional documents to Ofwat that set out our more detailed cost evidence in support of our Business Plan. The documents we submitted that are relevant to the errors we are asking the CMA to remedy are:[2]

SRN-DDR-027	Supply Resilience Enhancement Programme Cost Evidence Case
SRN-DDR-028	Water Resources - Supply Enhancement Cost Evidence Case
SRN-DDR-029	Water Resources - Demand (Leakage) Enhancement Cost Evidence Case
SRN-DDR-042	Industrial Emissions Directive (IED) Enhancement Cost Evidence Case
SRN-DDR-045	WINEP - Monitoring Enhancement Cost Evidence Case

24. We undertake a cost benefit approach to refine our long list of solution options to deliver the enhancement down to a shortlist. We identify a best value and least cost option which is reviewed by a technical and commercial internal panel to make decisions. This process is discussed in detail in our October 2023 Business Plan cost and optioneering Technical Annex – SRN 15.[3]

2.4 How Ofwat sets enhancement costs

25. As part of its price control review process, Ofwat assesses the merits of our proposals for enhancement. In doing so, it is guided by its price review methodology which it consults on and publishes at an early stage in the price review process. Ofwat published its PR24 Final Methodology in December 2022.[4]

26. Ofwat states in the PR24 Final Methodology that

> "*For all enhancement expenditure requests we will consider the need, optioneering, cost efficiency and customer protection evidence presented by companies. In PR19 for most enhancement expenditure we used unit cost and simple econometric models largely based on forecast data to set efficient expenditure allowances. We will build on this approach for PR24 and, where appropriate, will use historical and forecast expenditure to set efficient expenditure allowances. For the remaining expenditure where costs are material, we will use engineering deep dive assessments to identify an efficient cost allowance. Thorough consideration of bottom-up evidence is an appropriate regulatory approach to setting cost allowances when top-down benchmarking approaches do not provide robust results.*"

27. However, for PR24, where it could, Ofwat developed scheme level benchmarking models to assess enhancement expenditure. To do so, Ofwat collected data from all companies in the sector to estimate what it should cost for an efficient water company to deliver our enhancement programme. These models include cost driver information such as the number and size of different assets as well as other factors that Ofwat considers will affect costs.

[2] Southern Water, August 2024, SRN-DDR-027: Supply Resilience Enhancement Programme Enhancement Cost Evidence Case, SOC-3-0001. Southern Water, August 2024, SRN-DDR-028: Water Resources – Supply: Enhancement Cost Evidence Case, SOC-3-0002. Southern Water, August 2024, SRN-DDR-029: Water Resources - Demand (Leakage) Enhancement Cost Evidence Case, SOC-3-0003. Southern Water, August 2024, SRN-DDR-042: Industrial Emissions Directive (IED) Enhancement Cost Evidence Case, SOC-3-0004. Southern Water, August 2024, SRN-DDR-045: WINEP - Monitoring Enhancement Cost Evidence Cas, SOC-3-0005.
[3] Southern Water, October 2023, SRN15 Cost and Option Methodology Technical Annex, SOC-3-0020.
[4] Ofwat, December 2022, Creating tomorrow, together: Our final methodology for PR24, page 77, SOC-3-0006.

28. Where similar programmes of investment have been carried out in the past, Ofwat tried to incorporate historical data into its models. Such approaches may be useful if many companies have delivered similar enhancement programmes in recent years to those they propose to in future periods. However, this is rarely the case. Where there are few schemes and where proposals are to meet new requirements, accurate estimation of enhancement programme costs is challenging.

29. For enhancement allowances to be estimated using a top-down benchmarking approach it is important that the scope of activities being benchmarked is common and repeatable, that the exogenous conditions that may affect costs are accounted for, that the cost drivers make engineering sense, and that there is a sufficiently large and representative dataset underpinning robust statistical models.

2.5 Difference between base and enhancement costs.

30. When Ofwat assesses costs through its price review processes it expects us to clearly distinguish between cases for enhancement and cases for base costs. The level of service that is funded through the base allowance ("what base buys") has been a matter of some contention and debate which can make the distinction between base and enhancements an area of disagreement. The level of service that is funded through base has not been clearly set out in previous price reviews.

31. There are also matters of debate around the activities and investment of the past and their link to particular improvements in service or performance. For example, one company may have renewed a certain length of water main to achieve an improvement in performance on leakage. Another company could achieve the same improvement in performance through an enhanced pressure management programme. This leads to differing opinions on what proportion of the improvement was delivered by which activity as well as considerations of how persistent the improvement from each enhancement programme would be. This flexibility to deliver outcomes through different approaches is an important driver of efficiency across the industry and its supply chain.

32. Ofwat defines base costs as:

> "*routine, year-on-year costs, which companies incur in the normal running of the business to provide a base level of service to customers and maintain the long-term capability of assets.*"[5]

33. It defines enhancement expenditure as:

> "*generally where there is a permanent increase, or step change in the current level of service to a new 'base' level and/or the provision to new customers at the current service level. Enhancement funding can be for environmental improvements to meet new statutory obligations, improving service quality and resilience and/or providing new solutions for water provision in drought conditions.*" [6]

34. At PR24, Ofwat made a number of uplifts to base cost allowances on the basis that the past is not a good predictor of the future. This resulted in a further blurring of the boundary between base and

[5] Ofwat, February 2025, PR24 final determinations: Expenditure allowances, page 18, SOC-1-0006.
[6] Ofwat, February 2025, PR24 final determinations: Expenditure allowances, page 95, SOC-1-0006.

enhancement activity and costs. Ofwat now expects "*companies to deliver more for customers and the environment with the higher base allowances including:*

- *replace more water mains to improve asset health;*
- *replace more water meters to help facilitate the smart meter programme;*
- *increase network capacity to facilitate new housing growth;*
- *meet more stringent phosphorus permit levels when treating sewage; and*
- *improve service performance."* [7]

35. Ofwat has allowed selective uplifts to the base cost allowances it calculated using its backward-looking econometric models for the specific purposes listed above. However, in error Ofwat made no similar uplifts in base for other areas where there is evidence that the past is not representative of future investment needs, for example at our water supply works. Instead, without analysis or evidence, the FD concludes that some of the costs we propose as enhancements are covered by the base cost allowance. We expand on this further in section 7 below.

3. Southern Water's AMP8 enhancement programme

36. The area we serve in the South of England is water-stressed[8] and it is imperative that we invest to improve drought related levels of service for our customers. Climate change is bringing much greater volatility and intensity in our weather, which places additional strain on water resilience. Higher and more intense rainfall create larger volumes of water and localised flooding which challenge the capacity of our sewer networks as never before.

37. Demand for water and wastewater services will grow as the population grows. At the same time, in Hampshire, we are developing new sources so that we can significantly reduce abstraction during droughts from precious local chalk streams and protect the natural environment. This need is driven by an EA legal requirement to reduce abstraction from chalk streams. Our WRMP24 is forecasting a risk of supply demand balance deficits in each of our 14 water resource zones, and we must invest to remove this risk. The deficits are due to the combined impacts of growth, climate change and the abstraction reductions to protect the environment, known as "sustainability reductions" and 10 of our zones are in deficit from the start of the WRMP24 baseline scenario[9]. Investment is urgently needed. Our communities have been very clear that they want resilient supplies of clean drinking water. They also want better environmental standards applied throughout the water cycle, backed by good regulation and by our collective ambition to improve key river and marine environments.

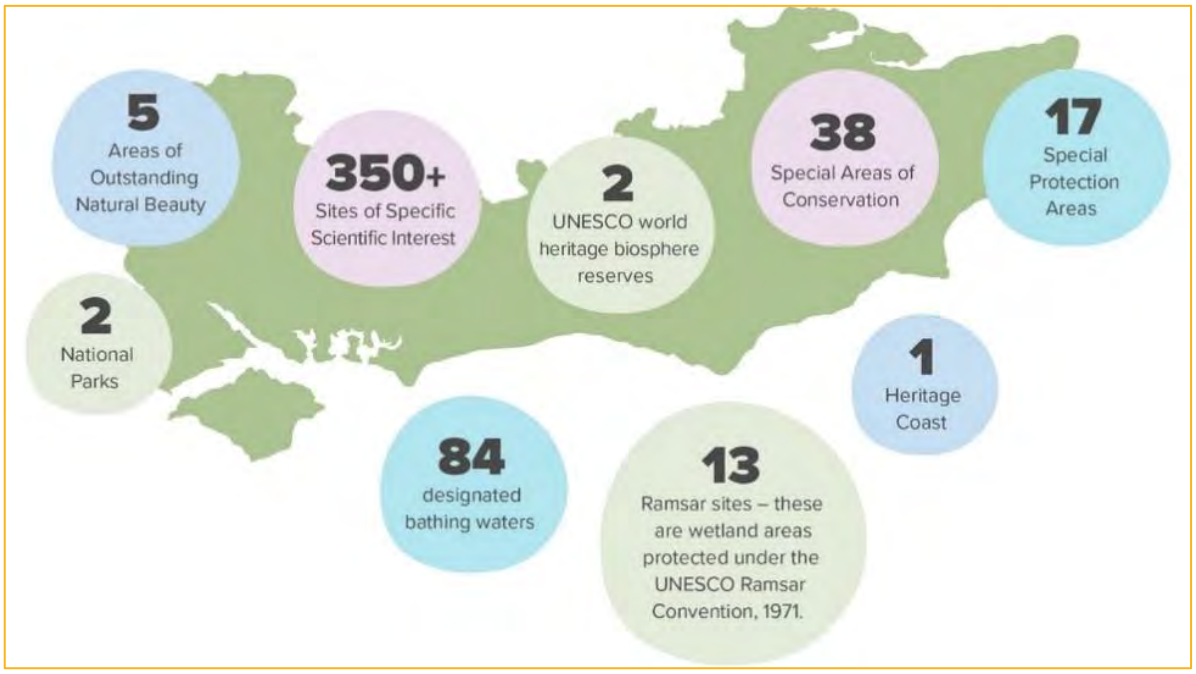
38. Our area has an abundant range of beautiful, fragile and protected areas as shown in Figure 1 below, and these require the highest standards of environmental protection.

39. All these factors are driving an unprecedented level of enhancement investment to meet the new challenges we face and the tighter standards of performance necessary to protect and enhance the

[7] Ofwat, February 2025, PR24 final determinations: Expenditure allowances, page 19, SOC-1-0006.
[8] Environment Agency, July 2021, Water stressed areas – final classification 2021, SOC-3-0008.
[9] This is an extreme drought scenario with a 1 in 500-year return period and companies must plan to be resilience to this risk. It is not a representation of our actual supply demand balance, but it is a real risk that we must mitigate to meet the minimum level of service for extreme drought actions.

environment. The improvements and new standards are mandated by regulations seeking to drive higher environmental performance across the country but with particular emphasis on protected areas.

Figure 1: Our region: its fragility, beauty and challenges



40. The environmental regulations requiring us to invest during AMP8 are extensive. There are new regulations requiring reductions in storm overflow discharge frequency, removal of nutrient loads discharged from our wastewater treatment works, and changes to how we manage our bioresources. Our access to sources of water to abstract for drinking water purposes are being constrained to protect the environment. The abstraction sustainability requirements companies must plan for in their WRMP24s have increased substantially since WRMP19 and by 2050 we could be required to offset a loss of over one third of our current supplies to protect the water environment. In addition, raw water quality is deteriorating to such an extent that our current treatment processes are no longer fit for purpose, and we must upgrade to more complex treatment to avoid outages and comply with DWI notices.

41. In the meantime, the population we serve is forecast to continue growing, putting pressure on existing infrastructure, requiring reinforcements to ensure all customers, both today and tomorrow, can receive the services they expect. The locations where growth is expected are causing local environmental pressures, with requirements for ensuring the nutrient loads to the environment are not increased (i.e., nutrient neutrality) slowing developers' ability to meet demand for new housing.

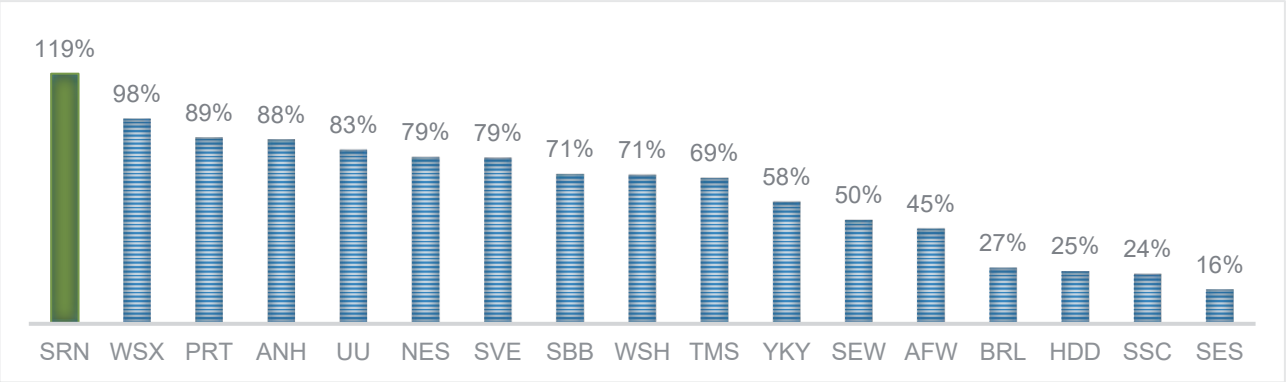
42. Since WRMP19, we have experienced unprecedented pressure on our existing water supplies. During the COVID-19 pandemic water use increased as most of our customers were at home during the day and using more water than they did in their place of work. A larger proportion of the population is now working from home than before the pandemic and this has had a sustained impact

on household water use.[10] In 2022, dry weather triggered drought actions in 17 companies and we were one of five to impose restrictions on water use to conserve water until the situation recovered. Climate change studies show that drought events will increase in frequency and severity in the future, and we must offset this risk through investment in demand reduction and sustainable water supplies.

43. All these factors are driving an unprecedented level of enhancement investment in AMP8 the majority of which is vital to meeting statutory requirements placed on us.

44. **A more significant issue for Southern Water**: Increased investment for environmental requirements is widespread through water companies, but particularly acute for Southern Water. We are in a unique position of having both a major water supply/demand programme and a significant wastewater environmental programme – both with a high degree of complexity. Even with the errors in its approach, Ofwat's FD cost allowance for our enhancement programme is larger than its cost allowance for our base costs – we are the only company where that is the case in PR24, as shown in Figure 2 below. This highlights how important it is that we are able to invest adequately to meet the enhancement needs we have, and how a material challenge to our enhancement costs cannot simply be accommodated within a smaller base cost allowance.

Figure 2: Ofwat's FD enhancement cost allowances as a percentage of base cost allowances



45. **High proportion of environmental regulatory requirements**: Overall our programme is addressing a large number of statutory obligations, requiring us in effect to deliver the enhancement programme. Only 0.3% (£16m) of our enhancement programme is intended for what Ofwat considers to be discretionary spending. This means that we only brought forward essential investments and we need a fair assessment of the efficient level of costs.

46. We presented our enhancement cases in our Business Plan categorised by what is driving the need to invest. We set out in the two tables below, our water and wastewater enhancement programmes by these high-level categories, showing the enhancement costs we submitted, underpinned by bottom-up evidence, as part of our DD Response.

[10] Gov.uk, January 2025, Official Statistics: Rail factsheet: 2024, SOC-3-0009 states: "There were 1,612 million rail passenger journeys in FYE 2024, a 16.4% increase on the previous year, (12% increase when excluding the Elizabeth Line). Despite the increase, passenger journeys remain 8.0% lower than the peak in FYE 2019." It is reasonable to assume that those who were commuting in 2019 are now doing so less often and there is a subsequent shift in location of water use to their homes away from their workplaces. This is particularly marked for companies serving areas around London but not London itself, such as Southern Water.

Table 2: Our water enhancement programme

Water Enhancement area	Description	Proposed investment in the DD Response, £m (before frontier shift and RPEs)	Regulatory Driver
Water supply resilience enhancement programme (SREP)	Investment at five water supply works to manage increasing risks from hazards beyond our control.	436	• Water Industry Act 91 • Water Supply Regulations 16 • DWI improvement Notices • DWI Regulation 28
WRMP Supply	Water supply schemes to meet requirements of statutory long-term plan (WRMP).	805	• Water Industry Act 91 • Water resources planning and supplementary guidelines • The Water Resources Management Plan Direction 2022 • National framework for water resources • Water Supply Regulations 16 • Environment Act 21 • Government's 25 Year Environment Plan • Environmental Improvement Plan • River basin management plans • Water Framework Directive
WRMP Demand	Water demand reduction programmes to meet requirements of statutory long-term plan (WRMP).	173	• Water Industry Act 91 • Water resources planning and supplementary guidelines • The Water Resources Management Plan Direction 2022 • National framework for water resources • Government's 25 Year Environment Plan • Environmental Improvement Plan
WRMP Strategic Resource Options	Development of strategic resource options to meet long-term water needs in the south east region developed as part of regional WRMP coordinated planning.	352	• Driven by the same regulatory drivers as WRMP
Water WINEP	Statutory environmental improvements and investigations to understand water	73	• Environment Act 21 • Water Framework Directive • Water Industry Strategic Environmental Requirements

	company impacts on the environment.		
Network and information Security (NIS)	Investment to meet requirements of 2018 regulations on cyber security.	99	• Network and Security Regulations 18
Security and Emergency Measures Directive (SEMD)	Investment to meet requirements of government directive to maintain security and emergency preparedness.	48	• Security and Emergency Measures Direction 98
Raw Water Deterioration	Investment to ensure treatment facilities can accommodate deteriorating raw water quality and still meet excellent drinking water quality standards (DWI supported).	95	• Water Framework Directive • Drinking Water Directive • DWI letters of support
Reservoir Safety	Investment to increase the safety at two surface water reservoirs which result from statutory inspections.	31	• Reservoir Act 75
Lead	Investment towards long-term government lead removal target through lead pipe replacement.	20	• Drinking Water Directive • Water Industry Act 91 WIA
Metering	Smart metering programme to support demand reduction elements of statutory WRMP.	79	• Government's 25 Year Environment Plan • Environmental Improvement Plan • Water resources planning and supplementary guidelines • The Water Resources Management Plan Direction 2022
Other	Payments to Portsmouth Water regarding Havant Thicket Reservoir.	99	• Water Industry Act 91 • Water Supply Regulations 16
Total		**2,311**	

Table 3: Our wastewater enhancement programme

Wastewater enhancement area	Description	Proposed investment in the DD Response, £m (2022/23 prices before frontier shift and RPEs)	Regulatory Driver
Storm Overflows	Statutory improvements to reduce storm overflow discharge frequency.	1,132	• Environment Act 21, • Environmental Permitting Regulations, • Bathing Water Directive • Shellfish Waters Directive • Water Framework Directive • Urban Wastewater Treatment Directive
Enhancing Wastewater Treatment	Statutory improvements to meet tighter effluent standards for nutrients.	793	• Shellfish Waters Directive • Water Framework Directive • Urban Wastewater Treatment Directive • Habitats Directive • Environment Act 21
Bioresources IED	Statutory improvements to protect the environment from risks relating to bioresources treatment.	171	• Industrial Emissions Directive • Urban Wastewater Treatment Directive • Environmental Permitting Regulation
Operational Resilience	Investment at both treatment works and in the network to manage increasing risks from hazards beyond our control.	61	• Water Industry Act 91
Growth at STWs	Investment to accommodate population and prevent deterioration to the environment and meet permit needs.	348[11]	• Urban Wastewater Treatment Directive • Water Industry Act 91 • Environmental Permitting Regulations • Local Planning and Development Regulations
WINEP Monitoring	Statutory investment to monitor wastewater flow compliance.	214	• Urban Wastewater Treatment Directive • Environmental Permitting Regulation • Bathing Water Directive • Shellfish Water Directive

[11] Investment spread over AMP8 and AMP9.

Wider Environmental Enhancements	Statutory investigations to understand the impact of company activities on the environment and inform future investment programmes.	47	• Water Framework Directive • Water Industry Strategic Environmental Requirements
First Time Sewerage	Statutory investment to provide connection to the sewerage system on request.	6	• Section 101A Water Industry Act 91
Bioresources	Statutory improvements to mitigate risks to landbank for recycling treated products.	51	• Industrial Emissions Directive • Urban Wastewater Treatment Directive • Environmental Permitting Regulation
PR19 WINEP carryover	Completing the statutory improvement programme from PR19.	87	• Urban Wastewater Treatment Directive • Environmental Permitting Regulation • Water Framework Directive
Total		**2,911**	

4. Introduction to the errors

47. **Ofwat's approach to cost assessment had profound implications for Southern Water**. The difference between our DD Response enhancement costs and Ofwat's allowance in the FD is material and beyond what could reasonably be expected as an efficiency catch up and/or accommodated within our base cost allowance.

48. There is a total enhancement cost gap of £604 million, a 12% gap between costs proposed in the DD Response and the FD allowance.

49. Ofwat used weakly performing top-down models and applied arbitrary challenges to costs based on its qualitative review of the company-specific evidence we provided. In the case of three areas of wholesale water investment, namely mains replacement, resilience and a water supply scheme, Ofwat made no enhancement allowance but concluded that £188 million of these costs are implicitly funded by the base allowance, with only £6 million further base allowance being granted.

50. In consequence, the FD allowance with respect to enhancements is not sufficient to enable us to deliver the outputs that we are required to deliver pursuant to statutory and regulatory requirements. Such a determination is not consistent with the statutory general duties to which Ofwat and the CMA are subject.

51. Due to the complexities of our enhancement cost requests and Ofwat's assessments, and in view of the overall burden on the CMA in conducting this redetermination, we are restricting our request for a redetermination of our allowance with respect to enhancements to a limited number of schemes and areas where the gap is most material. The nine specific enhancement cost deductions for which we are requesting a redetermination total £304 million and are listed in Table 4 below.

52. As regards the remaining aspects of our enhancement shortfall:

- Ofwat proposed to deal with a significant proportion of the £604 million cost gap through adjustment mechanisms specified in the FD. This accounts for £98 million of the cost gap. While there is uncertainty and risk to us from adopting such mechanisms, we are not asking the CMA to redetermine an appropriate enhancement cost allowance in place of mechanisms for these areas. We discuss elsewhere in this SoC what we are asking the CMA to remedy with regard to such mechanisms.
- There is an enhancement programme, reducing the frequency of spills from storm overflows, where there is a £120 million gap between our view and Ofwat's view of costs in the FD. A material proportion of our storm overflows programme is covered by the delivery mechanism and we are requesting that the CMA alters this mechanism to be based on the most up to date information relating to both scope and costs. This is our preferred approach to deal with cost uncertainties related to the storm overflows programme, rather than a redetermination of the enhancement cost allowance.
- Other components of our enhancement shortfall relate to schemes and areas where the cost gap is less material than in the nine cases listed in Table 4 below. Typically, the shortfall in such schemes and areas arises from the application by Ofwat of the same flawed approaches described below with respect to the cases for which we are requesting a redetermination. While we are not presently requesting that the CMA makes a redetermination in relation to such schemes and areas, to the extent that the CMA's investigation extends more widely into Ofwat's approach to enhancements (e.g. at the request of another Disputing Company), we reserve the right to make further submissions to the CMA in respect of such matters.

53. The nine specific enhancement cost deductions for which we are requesting a redetermination are listed below.

Table 4: Cost deductions included in enhancement cases being appealed

Enhancement category	£m gap	Ofwat approach
Water supply interconnectors	20.2	Econometric model
Bioresources Industrial Emissions Directive	33.6	Econometric model
WINEP flow monitoring at sewage treatment works	21.0	Deep dive assessment
WINEP monitoring at emergency overflows	27.9	Deep dive assessment
WINEP - Water	3.6	Cost efficiency challenge applied through shallow dive assessments
Wastewater shallow dives	10.2[12]	Cost efficiency challenge applied through shallow dive assessments
Mains Replacement	106.8	Econometric model / base adjustment
Water resilience	59.7	Deep dive assessment
Water supply scheme	21.3	Deep dive assessment
Total	304.3	

[12] This value includes a £5.4 million reduction from Ofwat's shallow dive assessments on EDM Monitoring, NTAL Monitoring, Nature-Based Solutions, Microbiological Treatment, and Fish Screens, plus a £4.8 million cut from its assessment of our Budds Farm storm overflows scheme, which applied a 10% "company level efficiency challenge". While not explicitly labelled a shallow dive, this approach aligns with the method and is treated as such.

54. A summary of the three categories of error made by Ofwat with respect to enhancements in the FD follows. Subsequently, each error is considered in detail with reference to the specific schemes and areas of investment to which they relate.

4.1 ERROR 1: The FD uses weak top-down models where there is significant scheme complexity, variability and company-specific factors driving variations in cost. The models are not statistically robust or appropriate.

55. **Ofwat's modelling approach over-simplifies the assessment of complex schemes**: In accordance with Ofwat's PR24 requirements, we provided engineering-based bottom-up assessments for need, options appraisal and cost efficiency for each of our enhancement programmes. In many material cases Ofwat disregarded the evidence and assessed costs using simplistic models that were not statistically robust.

56. **There has been no attempt to verify top-down modelling where the result significantly differs from the bottom-up costing**. Ofwat was wrong to over-rely on top-down modelling in the face of bottom-up cost evidence, especially where there is a significant difference in results. Top-down modelling would always be inferior to bottom-up assessments, and the FD is wrong to assume that the top-down modelling is superior and should be used in preference to bottom-up cost assessments. This is especially true for where the schemes in question are highly bespoke.

57. **Lack of consultation on modelling**: Ofwat did not consult companies on the enhancement cost models ahead of the DD, despite the very significant amounts of expenditure that would be made subject to those models. Ofwat's approach and the modelling outcomes have changed materially between DD and FD. Earlier consultation may have enabled companies to explain some of the issues resulting from Ofwat's approach.

58. Specific cases in point are listed below:

- **Water supply interconnectors:** Ofwat's approach to setting cost allowances was inappropriate because it ignored scheme specific cost data and applied an inappropriate econometric model to estimate an allowance for our supply interconnector schemes. The model used both historical and forecast costs to calculate the allowance with an additional uplift for crossings. Historical costs are not a good predictor of future costs in this instance and the data samples for both the historical and forecast schemes were extremely limited. Nor did it account for the vast range of scope differences that influence costs. Ofwat's model was not a robust statistical relationship between costs and cost drivers.
- **IED modelling approach was not robust:** Ofwat used scheme level models to set IED enhancement allowances. It used three models to set secondary containment allowances and one model to set cost allowances for tank coverings. The models are deficient because they do not display robust statistical relationships between costs and cost drivers. Despite this, Ofwat applied an upper-quartile catch-up efficiency challenge for secondary containment costs and a median catch-up efficiency challenge for tank covering costs. The simplistic modelling approach Ofwat used in the FD results in an implausible range of efficiency scores across the sector. Ofwat applied the efficiency factors it had derived from the weakly performing models to other IED costs which it could not model, thus amplifying the effect of this error.

59. These points are expanded upon in the Section 5 below.

4.2 ERROR 2: Ofwat has applied inappropriate and arbitrary top-down challenges to costs through its assessment of the evidence we provided

60. Where benchmarking approaches were not suitable, Ofwat's methodology was to carry out "*bespoke assessments including considering the use of cost efficiency engineering deep dives, or shallow dives as appropriate. We will undertake deep dives to assess cost efficiency where spend is material. But retain the flexibility to deep dive lower value costs where appropriate.*"[13]

61. A deep dive considers evidence across four criteria:

- need for enhancement investment;
- best option for customers;
- cost efficiency; and
- customer protection.

62. In its PR24 Final Methodology Ofwat set out guidance for the evidence it would expect to underpin enhancement expenditure.[14] It stated, "*The evidence supporting these criteria should be sufficient and convincing unless otherwise specified*". The words "sufficient and convincing" were not further defined or explained. Ofwat was not transparent about the standards of evidence required to meet the different levels of the arbitrary "sufficient and convincing" scale it used. In the FD, where it deemed evidence insufficient it categorised the evidence as causing one of: minor concerns (where it applied a 10% challenge); some concerns (20% challenge); or significant concerns (30% challenge).

63. Ofwat applied a risk-based approach to its assessment, ensuring that more material costs were reviewed through a deep dive, whereas it carried out shallow dives on less material investment lines. In general, it carried out a shallow dive assessment where the expenditure was less than 0.5% of the water or wastewater wholesale totex or less than £10 million, although Ofwat retained discretion as to when it applied a shallow or a deep dive.

64. Ofwat applied a company-specific efficiency challenge to projects where it undertook a shallow dive. It derived the company-specific efficiency challenge from the application of benchmarking models to unrelated enhancement projects.

65. As a result of Ofwat's approach in the FD the following occurred:

- **Shallow dives have resulted in arbitrary cuts:** Ofwat has extrapolated its efficiency findings from the weak modelling approach (explained above) to reduce allowances on other (less material) areas of the plan through a company specific efficiency factor. Ofwat's approach and use of this efficiency challenge resulted in reductions to allowances of £3.6

[13] Ofwat, December 2022, Creating tomorrow, together: Our final methodology for PR24 Appendix 9 Setting expenditure allowances, page 27, SOC-3-0010.
[14] Ofwat, December 2022, Creating tomorrow, together: Our final methodology for PR24 Appendix 9 Setting expenditure allowances, page 154 – 156, SOC-3-0010.

million in water and £10.2 million in wastewater. This amplifies the error from the weak top-down modelling approaches.

- **In the case of deep dives, Ofwat applied arbitrary cost efficiency challenges where it deemed evidence provided by the company was insufficient.** This is illustrated by Ofwat's approach to **WINEP wastewater monitoring programmes** where:
  - Two monitoring programmes were made subject to significant cost challenges in the FD, namely (i) flow monitoring at sewage treatment works, and (ii) monitoring of spills and PFF at emergency overflows.
  - In both cases, Ofwat carried out a deep dive of our programme costs and set an arbitrary cost efficiency challenge of 30% on the basis that it had "significant concerns" with our cost efficiency evidence, despite the company providing extensive additional benchmarking evidence in our DD Response. This led to a reduction in our allowances of £49 million. There is no transparency over what was missing in our evidence to justify the 30% challenge.

66. These points are expanded upon in the Section 161 below.

4.3 ERROR 3: Ofwat disallowed enhancement allowances on the erroneous basis that activities are funded within the base cost allowance

67. Ofwat's disallowance of enhancement costs on the basis they are implicitly funded in base resulted in the removal of £188 million from our proposed water enhancement programme. There is only £6 million additional base totex allowed as a positive mains renewal cost adjustment for our proposed material step-change in the level of activity. £188 million is equivalent to a further 23% efficiency challenge to our modelled wholesale water base totex allowance – which the company cannot reasonably be expected to achieve.[15]

68. **The programmes in relation to which Ofwat disallowed enhancement allowances on the basis that it considered the activities to be within the implicit base cost allowance are**:

Mains replacement:

- Ofwat assumed an industry average rate of 0.30% of each company's total length of mains per year is replaced through base cost allowances. This was derived through analysing the average mains replacement rate across the sector from 2011-12 to 2022-23. Ofwat did not take into account alternative and equally valid approaches to calculating the level of mains that could be assumed to be implicitly allowed for in base cost allowances.
- Ofwat increased its assumption for the proportion of our mains network we need to replace using base cost allowances by 0.10% p.a. for asset deterioration since PR09 and asset grade condition. It used a measure that was discontinued in 2010 to do so, and one which can be influenced by activity other than replacing mains. It failed to consider the impact of its outcomes-based framework that has been in place since PR14 and penalised companies retrospectively for responding to the incentive regime in place.

[15] Ofwat's wholesale water modelled base cost allowance before post-modelling adjustments and pre-frontier shift efficiency and real price effects was £829 million, as shown in tab "Final allowances" of the model: Ofwat, December 2024, PR24-FD-CA05-Base-costs-water-model-3.xlsx, SOC-3-0011.

- Ofwat used a sector median unit cost (£/m) to calculate an additional cost allowance for mains renewal over and above the activity levels it assumed were covered by base costs. Its unit cost was based on uncertain costs for a large proportion of companies and did not account for factors that can vary the efficient costs of mains renewal. There are material regional differences that influence costs and we are carrying out atypical and additional scope of activity because our mains replacement programme is wholly focused on reducing leakage.

Water Resilience (Strategic Resilience Enhancement Programme (SREP)):

- Ofwat disallowed enhancement allowances for AMP7 transitional costs to upgrade treatment works as part of ongoing programmes to address deterioration in water quality and to comply with DWI notices. It did so on the grounds that there are overlaps with base cost allowances. However, the activities are needed to address a step change in the processes to mitigate water quality risks and for some sites we have selected solutions that support our WRMP and longer-term needs. Ofwat was inconsistent in how it applied its rules for transition funding. It also did not engage with the site-specific evidence we provided of the need to invest above and beyond asset replacements, nor take into account the implicit allowance we had deducted from our transition funding request.

Supply demand balance and metering

- Ofwat disallowed certain allowances in relation to a water supply scheme on the basis that elements of our programme of investment in this area had been funded in a previous price review. At PR19, a water supply scheme with a narrow scope was proposed and funded by Ofwat. During the initial phases of design of the AMP7 scheme, water quality sampling showed that the scope proposed and funded at PR19 was insufficient. We are therefore proposing to undertake a new, different scheme for AMP8 involving a far greater scope of work with additional treatment processes to ensure the water can be treated to the appropriate standards. In the FD, Ofwat disallowed all funding for the different, broader scheme we propose in AMP8 without full consideration of the driver of the increased cost.

  These points are expanded upon in the Section 7 below.

5. Error 1 – Enhancement assessments based on weakly performing models

69. In this section we explain the detail of the errors made by Ofwat in applying the results of weakly performing models to our programmes of investment in:

- Water supply interconnectors; and
- Industrial Emissions Directive.

5.1. Water supply interconnectors

70. **Ofwat was wrong to use a weak top-down modelling approach to estimate cost allowances for our water supply interconnectors. Our costs are not adequately funded in the FD (£20 million cost gap)**

	£m requested	£m allowed by Ofwat in FD	£m gap
Water supply interconnectors	201.9[16]	181.7	20.2

71. Supply interconnectors are pipelines and systems that move water around our region to ensure that changes in the location of where water is sourced from and areas of new demand (e.g. housing growth) can be accommodated whilst adequately supplying our customers with water into the future. In our PR24 Business Plan, we included an enhancement case for supply interconnectors that are required to provide customers with drought resilience as part of our WRMP24. Three of these interconnectors are required in 2030-31 to transfer water from a new water supplySRO[17] to a treatment works then on to service reservoirs to meet customer demand in the Hampshire region.

72. The supply interconnector schemes were selected as part of our WRMP24 and are required to ensure that we maintain a supply and demand balance over the long-term, protecting our customers from the risk of water shortages. A significant driver of possible shortages is the protection of chalk stream environments, and we are required to reduce how much water we abstract from these watercourses and the aquifers that feed them. In the short term this reduction in abstraction will increase the risk of drought measures (such as hosepipe bans) being imposed on our customers during dry weather, but by 2030 the SRO and these associated interconnections will provide alternative water supply and a more flexible network for drought resilience.

5.1.1. Summary of previous representations

73. We requested funding for supply interconnectors in our October 2023 Business Plan submission to align with our draft WRMP24. Since our original submission we have revised our draft WRMP24 and updated the associated transfer capacity of our Hampshire Grid ALM. We also continued to progress our understanding of the required scope.

74. In our DD Response, August 2024, we explained the costs requested for these schemes had increased since October 2023 based on new information and availability of mature costs provided by our delivery partners as described in our Water Resources Supply Enhancement cost evidence case.[18] The three schemes are the Hampshire Grid Andover Link Main (ALM), the Hampshire Grid Southampton Link Main (SLM) and the Yew Hill to Rownhams, Testwood (also part of the SLM).

75. We explained all three schemes have progressed from concept design to outline design stage and significant site investigation works have been undertaken. Route alignment has been agreed, and archaeological, ground and environmental studies have commenced. The investigations provided essential information for detailed scoping of the schemes and deriving scheme specific costs. Our delivery partners have used these scopes to engage with the supply chain and develop market costs for pipework and associated enabling work, land drainage and further archaeological environmental studies and mitigations. The costs have been checked across their parent organisations and

[16] The total assessed cost for AMP8 was £211.9 million, which included £10.0 million for a scheme that in the revised WRMP24 is not needed until 2050. Ofwat was made aware of this and did not include the scheme in its modelling.
[17] Havant Thicket Reservoir, the Hampshire Water Transfer and Water Recycling Project
[18] Southern Water, August 2024, SRN-DDR-028: Water Resources – Supply: Enhancement Cost Evidence Case, SOC-3-0002.

supported by further market testing by obtaining multiple quotes for elements of scope such as pipelaying, tunnelling and work at the relevant service reservoirs.

76. We, and other companies, pointed out the flaws of Ofwat's simplistic approach to assessing costs in the DD that did not account for legitimate factors that influence the costs of interconnector schemes. In October 2024 we provided Ofwat a supplementary submission requesting it assess our supply interconnector costs through a deep dive taking into account the maturity of our cost data[19].

5.1.2. Principles for setting cost allowances for supply interconnectors

77. The costs of building an interconnector scheme to move water from A to B could vary depending on:

- Distance from A to B (i.e., length of pipeline);
- The diameter of the pipeline (which is likely to be determined by the required peak flowrate of water to transfer from A to B);
- The scope of additional assets included in the scheme such as pumping stations, meters, break pressure tanks, offtake points and telemetry;
- Ground/soil conditions along the route;
- Nature of the route – whether urban or rural, number and complexity of crossings of other utilities/natural features, protected status of the land, permissions to access the land and any associated permits;
- The materials from which the pipeline is constructed;
- Whether the pipeline is carrying raw untreated water or treated water (which may require addition of disinfection booster stations along its route); and
- Local labour costs to lay the pipeline.

78. To set an efficient ex-ante cost allowance, Ofwat (and the CMA) needs to assure itself that the scheme is both an efficient scope and that the costs for that scope are efficient, taking into account all material factors that could cause costs between interconnectors to differ.

5.1.3. Ofwat's FD

79. Ofwat assessed costs using a top-down econometric model. This resulted in an allowance in excess of the amount we requested for our Yew Hill to Rownhams, Testwood SLM scheme, and an allowance that was below the amount we requested for both the Hampshire Grid ALM scheme and the Hampshire Grid SLM schemes. The net allowance has underfunded the three schemes by £20 million compared to our mature bottom-up costs.

80. Ofwat's modelling approach can be divided into four steps whereby:

1) A total cost estimate (including any costs beyond AMP8) was derived for each PR24 supply interconnector scheme using a logarithmic regression model based on historical costs for supply interconnector schemes delivered by water companies in AMP7;
2) A second total cost estimate was derived for each scheme by applying the same modelling approach to the forecast costs submitted by water companies at PR24;

[19] Southern Water, October 2024, SRN - Supplementary submission_Oct-2024, SOC-3-0061

3) The regression modelling outputs were multiplied by the percentage of expenditure planned for the AMP8 period to derive historical and forecast costs for AMP8 which were weighted (50/50) to provide an AMP8 cost estimate for each scheme and;
4) The weighted cost estimate was adjusted for above average length of crossings if applicable. For Southern Water a 2.46% uplift was applied.

81. The historical and forecast models included the same two cost drivers: benefit in Ml/d and length of interconnectors in km. The definition of benefit was the annual average utilisation volume converted to a daily average. This is not an appropriate driver from an engineering perspective, as the sizing of a pipe is the peak flow it needs to transmit.

82. Table 5 shows the FD AMP8 modelled cost allowances for the three interconnector schemes compared to our DD Response (the 'requested cost' column). Ofwat's model resulted in a total allowance lower than we need to deliver the three schemes. The uplift for atypically high length of crossings for the Yew Hill to Rownhams, Testwood SLM schemes reduced the gap by £4 million but the final allowance is £20 million less than we need to deliver the schemes.

Table 5: FD requested and modelled AMP8 costs for the three supply interconnector schemes

Scheme name	Requested cost, £m	Forecast model, £m	Historical model, £m	50/50 models, AMP8, £m	Cost gap, £m	Total with crossing uplift applied, £m	Total cost gap, £m
Hampshire Grid ALM	84.12	58.41	45.48	51.95	-32.17		
Yew Hill to Rownhams, Testwood - SLM	90.05	108.05	98.75	103.40	+13.35		
Hampshire grid - SLM	27.72	21.78	22.29	22.03	-5.69		
Total	201.89	188.24	166.52	177.38	-24.51	181.74	20.15

Note: These costs are for AMP8 expenditure only and the schemes will not be fully completed until AMP9. We will request funding to complete the schemes at PR29.

5.1.4. Ofwat's modelling is not robust

83. Ofwat's approach disregarded our scheme specific scope and costs that are provided by our delivery partners and applied an inappropriate econometric modelled allowance, with no reference to the bottom-up evidence. The model was not appropriate for two reasons: a) it assumed historical costs are a good indicator of future costs; and b) it did not account for all complexities and variations that influence the costs of construction and installation of pipelines. Both points are considered further below.

a) Historical costs are not a good predictor of future costs for supply interconnector schemes

84. The use of the historical data serves to reduce the cost allowance. At sector-wide level, use of historical data resulted in a lower total allowance for 17 out of 19 requested interconnector schemes than if Ofwat had relied exclusively on forecast data. The historical model reduced our total requested costs by 35% whereas the forecast model adjustment was much closer to our bottom-up estimates at a 9% challenge.

85. The below table shows how the two sets of models (forecast and historical) compare in terms of the allowances for all interconnector schemes.

Table 6: Industry proposals and allowances for water supply interconnector schemes

Company	Scheme description	Total requested Cost (AMP8 and AMP9) £m	Modelled allowances (forecast) £m	Modelled allowances (historical) £m	Cost gap forecast v historical £m	Difference
Affinity Water	Egham to Iver transfer	61.19	51.43	40.01	-11.42	-22%
Anglian Water	Potable transfer in the Essex area	9.75	25.61	20.29	-5.32	-21%
Anglian Water	Potable transfer in the Lincolnshire area	94.78	87.70	64.95	-22.76	-26%
Anglian Water	Two potable transfers in the Cambridge area	344.43	271.71	171.73	-99.98	-37%
Anglian Water	Three potable transfers in the Norfolk area	290.22	325.73	192.27	-133.46	-41%
Anglian Water	Potable transfer in the Suffolk area	10.30	14.09	11.09	-3.00	-21%
Anglian Water	Two potable transfers in the Norfolk area	45.66	44.66	26.42	-18.24	-41%
Northumbrian Water	Barsham to Saxmundham and Holton to Eye trunk mains	118.98	123.77	72.67	-51.10	-41%
Northumbrian Water	Bungay to Barsham pipeline	13.83	6.39	4.27	-2.12	-33%
South West Water	Whitecross distribution upgrade	13.78	9.65	7.44	-2.21	-23%
Southern Water	**Yew Hill to Rownhams, [redacted] – SLM**	**102.77**	**120.68**	**97.10**	**-23.58**	**-20%**
Southern Water	**Hampshire Grid ALM**	**97.38**	**66.18**	**45.37**	**-20.81**	**-31%**
Southern Water	**Hampshire Grid SLM**	**39.94**	**30.71**	**27.67**	**-3.04**	**-10%**
Severn Trent Water	Carsington to Tittesworth main	163.35	170.30	107.83	-62.47	-37%
Severn Trent Water	Heathy Lea to North Notts transfer	108.10	132.74	89.39	-43.35	-33%
Dwr Cymru	SEWCUS network upgrade	20.42	17.86	19.14	1.28	7%
Dwr Cymru	Llwynon gravity	5.40	5.45	5.85	0.40	7%
Dwr Cymru	Crai Distribution Options	19.24	13.45	10.25	-3.21	-24%
Dwr Cymru	Ystradfellte- Reverse Flow through Tonna Control Valve	4.66	5.45	4.65	-0.80	-15%
Total allowance		**1,564.18**	**1,523.58**	**1,018.38**	**-505.19**	**-33%**

86. As can be seen from the above, the two approaches of modelling historical and forecast costs gave a wide range in cost estimates, with the historical cost approach heavily skewed towards underestimating what costs are required when compared to companies' plans by an average of 33%. This is not just an issue for Southern Water. 75% of the requested scheme costs are requested by the companies asking for a redetermination by the CMA.

87. The use of historical costs is not an appropriate methodology for multiple reasons.

88. To meet their supply demand balance, the WRMP scheme selection guidance prior to PR24 required companies to make use of the lowest cost solutions first before resorting to more costly solutions. As such, future costs will in most cases be greater than historical costs as companies have already delivered their lower cost schemes. Ofwat has assumed erroneously that cheaper solutions will continue to be available into the future.[20]

89. This problem of having used up cheaper solutions and being left with higher cost solutions in future is exacerbated by the scale and complexity of the water supply problem to be solved. The combined deficit between demand and supply of water for all companies in WRMP24 is over three times higher than in previous plans. At WRMP19, the total deficit across all water companies by 2044-45 was c.1.5 billion litres. For WRMP24, it is nearly 5 billion litres by 2049-50. This is around a third of current demand for public water supply (c.14 billion litres).[21] The increased deficit is driven by the Government's expectations for a sustainable and resilient water supply as set out in the 25 Year Environment Plan (2018), the National Framework for Water Resources (2020) and the Environment Improvement Plan (2023).[22] Our WRMP24 has been developed to meet the challenges and requires adequate funding for us to deliver.

90. A larger deficit requires a greater number of schemes to be selected with increasing complexity and cost relative to the position had the deficit been of a similar scale to previous AMPs. This increases the average unit cost per forward looking scheme compared to previous plans.

91. This is demonstrated by comparing the average unit costs for the AMP7 supply interconnector schemes to that of the forecast schemes in the Ofwat model. The AMP7 schemes have an average unit cost of £2.9 million/Ml/d. Using total costs for the AMP8 schemes the unit cost is higher at £4.5 million/Ml/d. The average unit cost per km is also higher in AMP8 at £4.1 million/km compared to £3.4 million/km in AMP7. Ofwat is using the AMP7 costs to weight the allowance disregarding the underlying rising marginal cost structure underpinning these schemes.

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[20] Although our proposed schemes are both least cost and best value in AMP8, we expect a difference in the costs per ML/d benefit to increase across the sector between AMP7 and AMP8. Until WRMP24, the process for selecting options was a least cost approach using the Economics of Balancing Supply and Demand (UK Water Industry Research 2002) methodology. The guidance for WRMP24 changed, requiring companies to put forward a **best value plan**. Best value takes account of factors in decision making such as natural capital, carbon and biodiversity. Companies are no longer required to select the lowest cost solutions. Despite its PR24 methodology stating it would take into account wider environmental benefits, Ofwat's approach to using historical data to set future costs penalises companies for selecting best value rather than lowest cost solutions (Ofwat, December 2022, Creating tomorrow, together: Delivering UK government priorities for the English water sector through our 2024 price review final methodology, page 5, SOC-3-0012, states "To support companies delivering best value, we will take into account wider environmental and social benefits more robustly and extensively in our assessment of enhancement expenditure).

[21] Gov.uk, December 2024, A summary of England's revised draft regional and water resources management plans, SOC-1-0019.

[22] HM Government, 2018, A Green Future: Our 25 Year Plan to Improve the Environment, SOC-3-0015, Environment Agency, March 2020, Meeting our future water needs: a national framework for water resources, SOC-3-0013 and HM Government, 2023, Environmental Improvement Plan 2023, SOC-3-0007.

b) Ofwat has not considered the complexities and variations that materially influence costs

92. Ofwat's modelling approach was simplistic and flawed, whereas our bottom-up costing approach considers both the efficient scope and the efficient costs for the selected scope.

93. The historical costs Ofwat used came from 18 supply interconnector schemes delivered in AMP7. This is not representative of the characteristics of all regions as 14 of the 18 schemes were delivered by a single water company, Anglian Water. This is over-reliance on one company's data. It is not a representative sample and does not provide sufficient consideration of variations between regions that can influence costs e.g., environmental designations, archaeology and population density. As we explain below, it is telling that even Anglian Water's forecast costs needed to be adjusted by Ofwat using post modelling adjustments for characteristics that neither the historical nor forecast model explained.

94. Ofwat's approach in the FD allowed for only three variables: length of pipe; benefit (Ml/d); and a post modelling adjustment for atypically high length of crossings. Ofwat's models assumed that costs are influenced by Ml/d benefit and length of pipeline only and that a logarithmic relationship can accurately predict costs. This uses the wrong metric for scaling according to the flow the pipeline needs to deliver and oversimplifies the variations in schemes that influence scheme costs, as we list above in paragraph 77.

95. Ofwat's benefit regression model is based on the costs of the annual Ml/d benefit. This is not always representative of the capacity needed in the pipelines, which are often able to transfer a higher peak flow than the annual average benefit Ofwat uses in its modelling. The ratio of annual average to construction capacity will vary significantly between schemes therefore this was not an appropriate cost driver. For example, our Hampshire Grid SLM interconnector was modelled by Ofwat at the annual average utilisation of 22Ml/d but the actual transfer capacity will be 46Ml/d from the new main, which will be used in combination with an existing main to achieve a total peak benefit of 74Ml/d from the scheme.[23] The Hampshire Grid ALM and Yew Hill to Rownhams, Testwood interconnectors will provide the same benefit during peak use as the modelled annual average utilisation.

96. Ofwat argued[24] that benefit and length were sufficient drivers as the more WAFU[25] benefit is delivered, the larger the diameter of the pipe is likely to be, and the more pumping capacity is likely to be required. This is an incorrect assumption as illustrated by the KPMG analysis [26]showing a weak correlation between WAFU benefit and these drivers presented in Table 7 below. The weak correlation between WAFU benefit and these drivers confirms the need for them to be accounted for separately in the assessment of costs, either through the models or through a post modelling adjustment.

[23] Southern Water, August 2024, SRN-DDR-028: Water Resources – Supply: Enhancement Cost Evidence Case, page 13, table 7, SOC-3-0002.
[24] Ofwat, December 2024, PR24 final determinations: Expenditure allowances - enhancement cost modelling appendix, page 143, SOC-3-0014.
[25] WAFU is "water available for use" and is a measure of supply in WRMPs. It is based on a dry year or critical period (usually peak week) scenario and not a measure of the design capacity of supply assets.
[26] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, SOC-2-0065.

Table 7: KPMG analysis of correlation between WAFU and other drivers of interconnector scheme costs

Drivers	Correlation Coefficient – WAFU Benefit
Diameter (mm)	0.57
Pumping Capacity (kW)	0.68
Storage Capacity (m^3)	0.30

97. Each of our supply interconnector schemes has been developed to detailed design stage and the scope of each scheme includes scheme-specific elements to address complexities that the Ofwat econometric model did not take into account. In our DD Response we evidenced the options appraisal process which shows the decision making-behind our selected scope. It also evidenced how our delivery partners have efficiently costed for all elements including assets, materials and studies. We provided our bottom-up evidence in our DD Response [27] and expand on it below.

98. The selected scope for these schemes includes additional assets, that are not part of the pipelines, for example service reservoirs, pumping stations, disinfection works, mechanical and electrical works to upgrade pump capacity to deliver the scheme benefit. The proportion these costs contribute to the total scheme cost varies between schemes as shown in Table 8 which gives a range of 18% to 26% for the three Southern Water supply interconnectors.

Table 8: Proportion of supply interconnector direct costs split between pipeline and other scope[28]

Scheme name	Pipeline cost, £m	Other scope items, £m	Other costs as % of total
Hampshire Grid ALM	68.5	15.2	18%
Yew Hill to Rownhams, [redacted] - SLM	68.5	20.9	23%
Hampshire grid - SLM	20.2	7.3	26%
Total	157.2	43.4	22%

99. Ofwat's models made no specific allowance for variation in such scope between interconnectors. It assumed that the costs of the additional assets are proportionate to the length of pipeline and average volume transferred. This is not a reasonable assumption as pumping requirements will depend on topography (pumping head) and the peak flow required to be pumped. The need for additional assets will depend on whether or not the existing services reservoirs, pumps etc. can accommodate the flows to be transported through the new interconnections. Ofwat made a specific £22.5 million post modelling addition for Anglian Water's Grafham interconnector to account for "mid-transfer treatment" which illustrates Ofwat's recognition that its models did not explain such scope variation between schemes.[29]

[27] Southern Water, August 2024, SRN-DDR-028: Water Resources – Supply: Enhancement Cost Evidence Case, SOC-3-0002.
[28] Southern Water, August 2024, SRN-DDR-028: Water Resources – Supply: Enhancement Cost Evidence Case, Section 5.3, SOC-3-0002.
[29] Ofwat, December 2024, PR24 final determinations: Expenditure allowances - enhancement cost modelling appendix, page 150, SOC-3-0014.

100. Other factors relating to the area where the pipeline is to be installed and that materially influence costs are not captured in the Ofwat model. They are not in proportion to the length or benefit of pipelines.

101. Following water company responses to its DD, Ofwat added a post modelling adjustment making an allowance for above average crossing length as an uplift to the weighed costs for schemes with atypical crossings. Ofwat applied the uplift based on total length of crossings for all schemes to provide a weighted average unit cost £m/km, multiplied by total length of pipes across all our schemes. In doing this, Ofwat recognised the need to provide for additional scope complexities and that interconnectors are not simply lengths of pipeline that are put in the ground with a standard crossing length per km of pipeline. This post-modelling adjustment resulted in a £4.36 million uplift to our cost allowance. However, Ofwat did not go far enough, because it did not allow for the full range of variables and complexities in delivering the schemes and particularly the valid variation in costs relating to crossings.

102. Ofwat has not verified its top-down approach against the bottom-up evidence we provided.

103. The scope for the Yew Hill to Rownhams, Testwood – SLM includes:

- 14.8km of ductile iron 900mm diameter pipeline (predominantly cross-country),
- Trenchless crossings of 1500mm internal diameter precast concrete pipe-jack, total length 755m, together with 10 shafts,
- New Yew Hill WSR with capacity for 8.5Ml,
- New inlets and flow control valve arrangement at Rownhams Water Service Reservoir (WSR),
- Land drainage to facilitate pipe laying.

104. The Hampshire grid – SLM schemes includes the following:

- 4.3km of ductile iron 700mm diameter pipeline (predominantly cross-country),
- Trenchless crossings of 1500mm internal diameter precast concrete pipe-jack, total length 1015m, with 6 shafts,
- New high lift pumping station at [redacted] SWS (requiring 945kW total installed power),
- Land drainage to facilitate pipe laying.

105. The modelling approach gives the highest cost gap for our Hampshire Grid ALM scheme. The scope is complex and is as follows:

- 22.5km of 600mm diameter pipeline, predominantly cross-country,
- Trenchless crossings of 1500mm internal diameter pre-case concrete pipe-jack, total length 1145m, together with 16 shafts,
- 2.9km of 400mm diameter pipeline, mostly in highways,
- Flow control valve cross connection at Crabwood WSR,
- New inlet and flow control valve connections at Micheldever Road WSR
- MEICA upgrade to accommodate new connections at Olivers Battery disinfection booster station
- New disinfection booster station at River Way WSW.

5.1.5. Factors that materially impact the costs of our schemes

106. A significant cost factor relevant to our interconnector schemes is the proportion of main that is suitable for open cut trench installation compared to trenchless (this is a form of tunnelling and is also known as pipe-jacking). The trenchless method is significantly more costly but for health and safety reasons must be used for stretches of pipe installation at crossings, particularly if in an area of large urbanisation requiring motorway crossings. Pipe jacking also provides resilience by installing larger pipe lengths within a tunnel to facilitate future relining if required versus constructing a second crossing at high expense at all critical crossings.

107. For the SLM (combined Yew Hill to Rownhams, Testwood and Hampshire grid – SLM) the total length of main is 19,100m and 90% (17,330m) of this can be installed as open cut at a direct cost of [redacted][31]. The remaining 10% (1,770m) is trenchless at a direct cost of £19 million. This means 90% of the route is 60% of the pipeline direct works cost (for open cut) and 10% of the route is 40% of the pipeline direct works cost (for the trenchless / pipe-jacks).

108. The Hampshire Grid ALM scope includes for 95% (24,255m) open cut installation and 5% (1,145m) trenchless. The 5% proportion of the total main that is to be installed as trenchless accounts for 42% (£17 million) of the total £40 million pipeline direct works cost for this scheme[30].

109. There are particular complications with the installation of the Hampshire Grid ALM pipeline beyond the complex scope that Ofwat did not take into account. In particular, there are two river crossings of the Test and Itchen which are both Sites of Special Scientific Interest (**SSSI's**) and have a buffer either side of riverbanks within the SSSI area. These require trenchless (pipe-jack) crossings which are longer than might be expected otherwise, so as not to undertake any construction activity at ground level within the SSSI. Natural England has required, through the Environmental Impact Assessment, that the installation must be by pipe jacking to avoid environmental risks that can be associated with other, less costly techniques.

110. At the detailed design stage, it became evident that the scope requirements for all three of our interconnectors required installation of ductile iron pipes instead of high-density polyethylene (**HDPE**) as we had originally assumed in outline design. At smaller diameters, ductile iron is more costly than HDPE but is more durable and performs better under stress. Ductile iron is therefore more suitable when laying pipe in highways. For example, a 2.9km section of the Hampshire Grid ALM from the River Way WSW to Micheldever Road water service reservoir (**WSR**) requires ductile iron as it is predominantly in highways, using sectional working within traffic management to lay it.

111. Ofwat's model did not account for pipe material, which will vary across the schemes. We note however, that Ofwat made a specific uplift of £76.5 million for Anglian Water's Grafham interconnector to account for pipe material, [32] indicating that Ofwat recognises pipe material as a factor driving variations in cost.

[31] Southern Water, ALM & SLM Indicative Spend Profiles, SOC-3-0026.
[32] Ofwat, December 2024, PR24 final determinations: Expenditure allowances - enhancement cost modelling appendix, page 149, SOC-3-0014.

5.1.6. Critique of the models' statistical robustness

112. The models rely on a small sample size of 18 schemes, both for the forecast and outturn models, and this raises several concerns regarding the validity of the results. See Figure 3 below. A small sample size weakens the ability of the model to detect the true relationship between variables, poses a risk of overfitting the model and increases the chances of the model violating Ordinary Least Squares (**OLS**) assumptions. We find that the residuals of the models are not normally distributed, and this violates a key assumption of OLS. The P-values from different normality tests, as shown in Table 9, are less than 0.05, leading us to reject the null hypothesis that the errors are normally distributed. Combined with the small sample size of the models, this is a strong indication that the models are unreliable.

Figure 3: Number of observations informing Ofwat's enhancement models

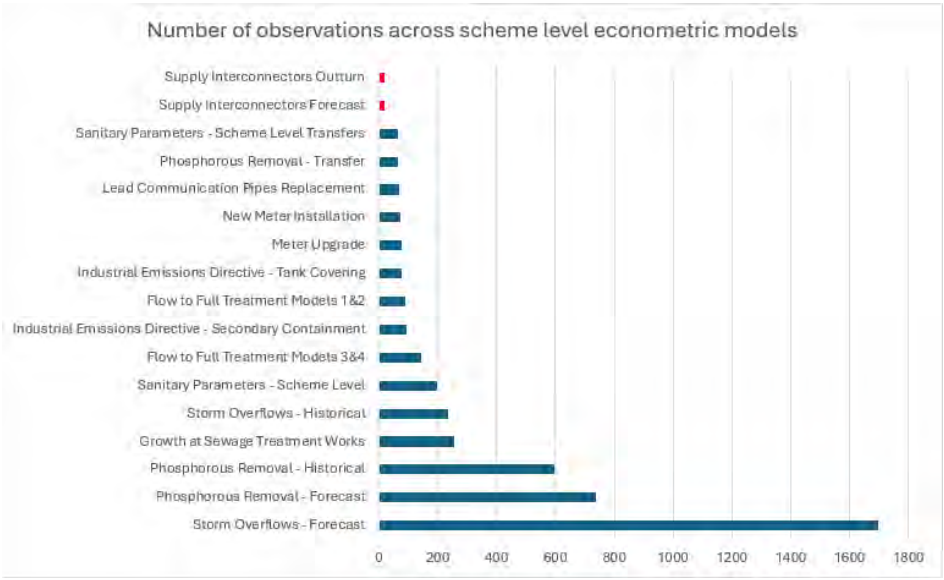


Table 9: KPMG analysis of statistical tests of robustness of the interconnector model[33]

Normality Tests	Forecast Model P-Value	Outturn Model P-value
Skewness/Kurtosis tests for Normality	0.004	0.02
Jarque-Bera normality test[34]	0.002	0.04

5.1.7. Remedy requested of the CMA

113. In the FD, Ofwat determined our enhancement allowance for water supply interconnectors using econometric modelling that was inadequate for the purpose. Scheme-specific information that drives differences in costs was not reflected in Ofwat's models. Ofwat has attempted to model complex

[33] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, SOC-2-0065.
[34] We also conducted the Shapiro-Wilk and Shapiro-Francia tests and the p-values are less than 5%, leading to the same conclusion that the errors are not normally distributed.

schemes but in doing so has assumed that costs are influenced by only a small number of variables, which we demonstrate above is not appropriate. The models used a limited sample of historical and forecast scheme costs to derive forecast costs and they perform poorly against statistical tests of model robustness.

114. We therefore request that the CMA provides an allowance of £201.9 million for water supply interconnectors by reference to the bottom-up evidence we provided to Ofwat with our DD Response and which is appended to this Statement of Case and, in doing so, allows funding for our requested costs that are based on scheme specific scope details and market data on costs of delivery.

5.2 Bioresources Industrial Emissions Directive

115. **Ofwat was wrong to use a weak top-down modelling approach to estimate cost allowances for our Bioresources IED costs. Our costs are not adequately funded in the FD (£34 million cost gap)**

	£m requested	£m allowed by Ofwat in FD	£m gap
Industrial Emissions Directive (IED)	172.1	138.5	33.6

116. In the FD, Ofwat used an econometric modelling approach that took no account of the scheme-specific scope which drives variations in the cost of improvements needed to meet the requirements of the IEDI. The detailed investment activities are specified by the EA in permit conditions. Failure to implement those investment activities could result in enforcement action by the EA, including the imposition of financial penalties.

117. We demonstrate below how Ofwat's models relating to capital investment perform poorly and should not be relied upon for determining cost allowances for such bespoke activities.

118. Ofwat amplified the errors resulting from its weak capex-based modelling approach by applying an efficiency factor derived from its models to other, more opex-based IED activities which it had excluded from the models, such as permit management costs and sampling. This is a further error in the FD, particularly in circumstances where, as here, Ofwat has determined our opex costs to be efficient through the application of base bioresources models.[35]

5.2.1. The scope of activities in our IED programme

119. The requirements of the IED were transposed into the Environmental Permitting Regulations (**EPR**) in 2013. These regulations take an integrated approach to controlling pollution to air, water and land, and aim to prevent and reduce harmful emissions by ensuring industries operate under Best Available Techniques (**BAT**). However, permits for our sludge treatment centres have only recently been issued, or in some cases are yet to be issued, leading to the need to invest to meet the specific improvement requirements specified in the permits.

[35] Ofwat, February 2025, PR24 final determinations: Expenditure allowances, SOC-1-0006, p. 363 shows our base bioresources forecast costs are £251m and Ofwat's FD allowance was £278m.

120. We have 16 sludge treatment centres (**STCs**) that fall above the threshold levels that require permits and investment in interventions to meet BAT.

121. Activities to meet the requirements of IED can be split into 3 categories:

- Secondary Containment: building bund walls around sludge digesters and tanks to contain spills, should any occur. They need to be able to contain all stored material should a rupture occur.
- Tank Covering: covering open sludge tanks to prevent fugitive emissions.
- Other IED Costs: includes a variety of activities, such as:
  - control and monitoring,
  - liquor sampling,
  - IED permit application,
  - and other miscellaneous costs.

122. We explain how Ofwat assessed each of these categories in the following section.

123. Our aggregate IED costs are £172.1 million. Our costs were derived through robust bottom-up costing methodologies which were explained and included in our DD Response and which are set out in Appendix SOC-3-0004 to this Statement of Case. [36]

124. In the FD, Ofwat set our IED allowance at £138.5 million based on a top-down model of our costs. This represents a 20% cost gap.

125. Ofwat's top-down modelling approach was not appropriate, as it assumed each company's scope is comparable. This is not the case for IED scope which is highly site-specific[37]. We have explored a wide range of top-down cost models and found none to have sufficient explanatory power to warrant their use as overall cost estimation tools.

126. Instead, we request that the CMA redetermines our IED allowance to be £172.1 million, reflecting the bottom-up evidence we provided to Ofwat with our DD Response, and which is appended to this Statement of Case. Such an approach would align with the CMA's view in its PR19 Redetermination that IED costs are site-specific in nature. [38]

127. The investment needed in the industry to meet IED requirements is relatively new and was not well-defined at the point of our Business Plan submission. This is because the sector did not have full coverage of permits with their defined conditions from the EA. At the time of our Business Plan submission, permits had not been issued for any of our IED sites. As of 3 March 2025, we have received final permits for six of our IED sites. These permits confirm the improvements required are in line with our current scope assumptions but also include investigations and reviews that may

[36] Southern Water, August 2024, SRN-DDR-042: Industrial Emissions Directive (IED) Enhancement Cost Evidence Case, SOC-3-0004.
[37] Scope variability is described in Southern Water, August 2024, SRN-DDR-042: Industrial Emissions Directive (IED) Enhancement Cost Evidence Case, SOC-3-0004, Appendix 5. For example, secondary containment need requirements are influenced by multiple site-specific factors such as the configuration of existing assets, ground surface material, and topography. As a result, the associated costs vary between £2.4m to £14.2m across our 16 IED schemes.
[38] CMA, March 2021, Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations, SOC-2-0009, paragraph 4.1099 states, "In general, we observed that IED compliance costs appear highly sensitive to the assessment of detailed requirements at specific sites. This accords with the Environment Agency's view that 'accurate estimates of the costs attributable to IED will only be available once all the site and company specific factors have been assessed and the review or issue of permits has been completed.'"

identify additional scope. Since the full extent of emerging scope is still uncertain and has not yet been fully evaluated, not all potential future costs are included in our current funding request. Ofwat recognised the uncertainty of the scope of work by applying enhanced cost sharing rates of 25% at the FD. We consider this mechanism a fair and reasonable way to manage these uncertainties as they arise. However, it is not an appropriate means to mitigate the effects of poorly performing top-down cost models for the scope we already have confidence we are required to provide.

128. Most of our IED expenditure falls within the Secondary Containment and Other IED cost categories, which (except for Secondary Containment) does not align with the sector-wide position as is demonstrated by Table 10 below. As a result, the scope of what we are required to do to meet IED requirements is different to that required of many other companies, which further illustrates why top-down comparative approaches are not appropriate. We discuss the implications of the low adjusted R-squared values below.

Table 10: IED requested and costs allowed by Ofwat by category and model R-squared values of models Ofwat used to derive cost allowances

	Secondary Containment	Tank Covering	Other IED costs
Business plan	£99.9m	£1.1m	£71.1m
Ofwat allowance	£68.5m	£12.8m	£57.2m
%age split of SW's IED cost allowance	49%	9%	41%
Sector-wide* split of IED cost allowance	44%	32%	23%
Ofwat's model adjusted R-squared value (and model driver)	0.323 (bund surface area) 0.288 (bund volume) 0.447 (combined drivers)	0.097 (tank surface area)	No model. Calculated efficiency from two other areas was applied to these costs.

*Numbers do not add to 100% due to rounding.

5.2.2. Principles for setting cost allowances for IED schemes

129. The costs of investing to comply with IED permit requirements are driven by site specific permit conditions that set out improvements to implement BAT. Improvement conditions are written by the EA's national permitting office at the time of issuing the permit. Once the permit has been issued, local EA enforcement officers are responsible for assessing company compliance with these conditions, including acceptance of plans and instruction of follow-on activities companies need to carry out.

130. Company costs will vary depending on the number of sites requiring permits and the complexity of those permits. Permit complexity will vary depending on:
    a) Existing assets, facilities, control and site layout;
    b) Number and type of storage facilities; and
    c) Sampling requirements.

131. In addition, costs will vary between companies depending on the number of sites requiring permits and the complexity of those permits.

132. To set an efficient ex-ante cost allowance, Ofwat (and the CMA) should assure itself that each scheme is both an efficient scope and that the costs for that scope are efficient, taking into account all material factors that could cause costs between IED compliance investment to differ. There is less flexibility in defining the scope of investment due to the prescriptive nature of the permit conditions provided by the EA. It will also need to consider the efficient costs of permit applications and associated costs that are unrelated to the scope of improvement investment needed.

5.2.3. How Ofwat assessed each category of expenditure and its errors in doing so

133. In the DD, Ofwat used a simplistic modelling approach with limited cost drivers. This top-down approach lacked statistical robustness and was not appropriate for IED costs, which are highly site specific.

5.2.4. Summary of previous representations

134. We included a request for enhancement funding to meet IED requirements in our October 2023 Business Plan submission and continued to refine the scope post submission. In December 2023 we resubmitted cost updates to Ofwat in response to Query 124[39] and Query 247[40]. Our DD Response reflects these updates.

135. Our DD Response raised numerous issues with Ofwat's top-down modelling approaches used in the DD.[41] This included the secondary containment model using only one driver, having a very low predictive power (R-squared of 0.2) and being used inappropriately to set an upper quartile efficiency challenge. In the FD, Ofwat addressed some but not all of the issues we raised.

136. We provided updated and detailed information on scope in response to queries from Ofwat throughout the price review process. These provided extensive and updated bottom-up evidence to support our proposals and inform Ofwat of the latest understanding of how the EA was implementing IED at our STCs. They also provided site-specific historical expenditure on maintaining our bioresources assets and extent of sampling requirements anticipated in our IED permits.[42]

5.2.5. Ofwat's approach at the FD

137. In the FD Ofwat assessed the costs of meeting the requirements of IED in 3 separate categories: secondary containment, tank covering and aggregated 'Other' costs.

[39] SRN Outbound Query Response OFW-OBQ-SRN-124, SOC-3-0034
[40] SRN Outbound Query Response OFW-OBQ-SRN-247, SOC-3-0037
[41] Southern Water, August 2024, SRN-DDR-042: Industrial Emissions Directive (IED) Enhancement Cost Evidence Case, SOC-3-0004.
[42] See query responses: Southern Water, November 2023, OFW-OBQ-SRN-124 IED information request, SOC-3-0063. Southern Water, November 2023, SRN Outbound Query Response OFW-OBQ-SRN-125, SOC-3-0035. Southern Water, December 2023, SRN Outbound Query Response OFW-OBQ-SRN-166, SOC-3-0036. Southern Water, March 2024, SRN Outbound Query Response OFW-OBQ-SRN-247, SOC-3-0037. Southern Water, October 2024, SRN October 2024 supplementary submission, SOC-3-0061.
Southern Water, OFW-REP-SRN-089 - Response, SOC-3-0039.

138. **Secondary Containment-linear regression models:**

- **Scheme-Level Modelling**: Ofwat developed three scheme-level econometric models using bund wall surface area, volume of bund, and a combination of both as cost drivers. These models were weighted equally and applied by Ofwat to determine allowances which it considered to be efficient. This approach is a significant change to Ofwat's DD, which considered bund wall length only. Ofwat's use of wall area and bund volume in the FD acknowledged that from engineering principles these were significant factors driving costs.
- **Company-Level Efficiency**: Ofwat applied an upper-quartile catch-up efficiency challenge to the modelled allowances using company level (rather than scheme level) efficiency calculations.

139. **Tank Covering- linear regression model:**

- **Scheme-Level Modelling**: Ofwat used a single scheme-level econometric model with surface area of tank covers as the only cost driver.
- **Company-Level Efficiency**: Ofwat applied a median catch-up efficiency challenge, based on company level efficiency calculations, to the modelled allowances.

140. Other IED Costs:

- **Company-Level Efficiency:** Ofwat determined an efficiency factor for each company based on the difference between (a) the company's aggregate requested allowances for secondary containment and tank covering and (b) the aggregate FD allowance for those schemes determined by the application of the scheme-level models for each category described above. Ofwat then applied this efficiency factor to "other IED costs". Our combined forecast cost for secondary containment and tank covering was £101m and the corresponding model allowance was £81m. This resulted in a company level efficiency of 80.4% applied to our 'Other' costs. This assumes that company-specific inefficiency is equivalent across all IED cost categories and has the effect of amplifying the errors resulting from a weak top-down modelling approach by applying its results to costs Ofwat was unable effectively to model.

141. Ofwat employed deep dives for outlier schemes. This was not applicable to any of Southern Water's IED schemes.

142. Table 11 below shows forecasted and allowed costs for each cost category within each IED scheme. This shows a correlation between the total cost gap and the size of secondary containment costs. Sites with significant secondary containment costs have a larger cost gap, except where tank covering costs, which received additional allowances under Ofwat's assessment methodology, offset this. The "Other" cost gap is consistent across all sites due to its calculation being based on company-level IED efficiency.

Table 11: Forecast and allowed costs for each cost category within each IED scheme, ordered according to largest total cost gap (all values in £ million). [43]

	Secondary containment		Tank covering		Other		Total		Total cost gap
STW	Forecast	Allowed	Forecast	Allowed	Forecast	Allowed	Forecast	Allowed	
Goddards Green	14.2	5.7			4.3	3.5	18.5	9.1	**9.4**

[43] Ofwat, December 2024, PR24-FD-CA89-Wastewter-Industrial-emissions-directive-enhancment-expenditure-model_redacted.xlsx, SCO-3-0056

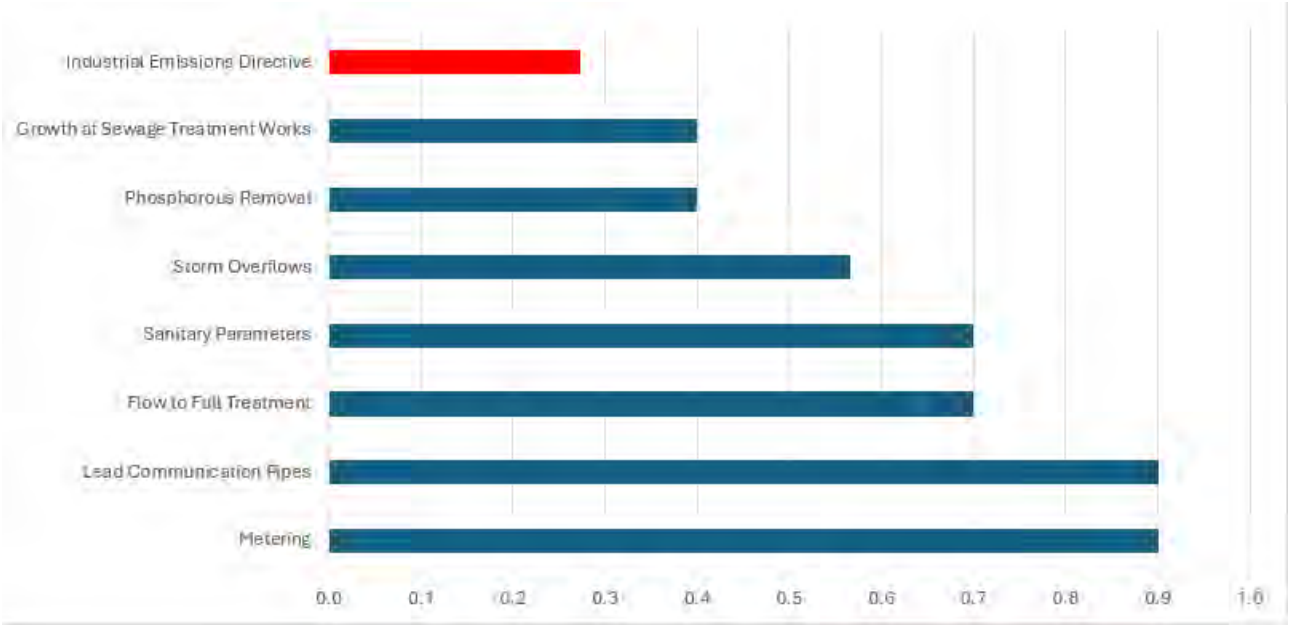
Millbrook	13.2	6.4			4.3	3.5	17.5	9.9	**7.6**
Sandown	9.1	4.6			4.3	3.5	13.4	8.1	**5.4**
Budds Farm	8.6	4.5			4.4	3.5	13.0	8.0	**4.9**
Ford	10.1	6.1			4.3	3.5	14.4	9.5	**4.9**
East Worthing	6.5	4.3			4.3	3.5	10.8	7.8	**3.0**
Gravesend	4.3	3.3			4.8	3.9	9.1	7.2	**1.9**
Bexhill & Hastings	5.4	4.5			4.3	3.5	9.6	8.0	**1.7**
Canterbury	6.3	2.7	0.3	3.2	4.3	3.4	10.8	9.4	**1.5**
Ashford	4.4	3.8			4.3	3.5	8.7	7.3	**1.4**
Aylesford	2.6	2.9			4.2	3.4	6.8	6.3	**0.4**
Queenborough	2.5	4.1			5.4	4.4	7.9	8.5	**-0.5**
Peacehaven	2.5	4.5			4.2	3.4	6.6	7.9	**-1.3**
Fullerton	4.6	3.9	0.2	3.1	4.3	3.5	9.1	10.5	**-1.4**
Ham Hill	3.0	2.6	0.5	3.4	5.1	4.1	8.5	10.1	**-1.6**
Motney Hill	2.8	4.4	0.2	3.1	4.3	3.5	7.3	10.9	**-3.6**
Total	**99.9**	**68.5**	**1.1**	**12.8**	**71.1**	**57.2**	**172.1**	**138.4**	**33.7**

5.2.6. Assessment of model robustness

143. **Low explanatory power of the models:**

- For both secondary containment and tank covering, Ofwat used the drivers that it assessed as explaining the highest level of variation. As shown in Table 11 above, for secondary containment, the **highest adjusted R-squared of Ofwat's models was 0.447** which means that for Ofwat's best model, 55% of the variation in costs between companies was unexplained and attributed to inefficiency. For tank covering, the single model **R-squared was much lower at 0.097,** leaving 90% of the variation in costs unexplained and attributed to inefficiency. Such magnitudes of unexplained variation raise concerns on the validity of Ofwat's approach to use these models to set cost allowances.
- In addition, comparing the average R-squared across all scheme level econometric models used by Ofwat in the FD, the IED models have the lowest average R-squared as shown in Figure 4.

Figure 4: Average R-squared values across Ofwat's scheme level enhancement models



5.2.7. Wide Range of Efficiency Scores.

144. As part of its model robustness tests, Ofwat used the efficiency score distribution to assess the validity of its models. Specifically, it stated that *"A large range of efficiency scores could indicate the presence of issues in the underlying model, such as the presence of omitted variables."* [44]

145. In this context, we set out below the efficiency score distribution of the IED models:

- A range from 0.49 to 1.72 for triangulated secondary containment cost models
- A range from 0.06 to 2.12 for the tank covering model[45]

146. The wide range of efficiency scores is implausibly large and another indication of the poor fit of these models and their inadequacy in explaining variations in efficient costs. It is not credible for some companies to be proposing schemes that are 94% cheaper than Ofwat's predicted costs, and others at greater than 100% of the predicted cost.

147. Furthermore, Ofwat applied an upper quartile efficiency challenge on the secondary containment modelled costs and a median efficiency challenge on the tank covering modelled costs, both of which are derived from the calculated efficiency scores. Given the wide distribution of efficiency scores and the overall inadequacy of the models, it is very likely that the derived efficiency thresholds are misleading and do not reflect the reality of the industry.

[44] Ofwat, December 2024, PR24 final determinations: Expenditure allowances – base cost modelling decision appendix, page 61, SOC-3-0017.
[45] An efficiency score of 0.06 means that a company's proposed costs are 6% of Ofwat's cost allowances as calculated by its modelling approach. Similarly, an efficiency score of 2.12 means a company's proposed costs are 212% of Ofwat's cost allowances as calculated by its modelling approach, i.e., more than twice the cost Ofwat considers to be the appropriate cost allowance.

148. During the CMA's redetermination of Bristol Water's PR14 FD, the CMA noted when considering the totex upper quartile efficiency benchmark,[46] "*[t]he regulatory precedent from Ofgem and the CC has also recognised that a less demanding benchmark than the upper quartile may be appropriate in cases where there was less confidence in the modelling results. The effect of modelling error and limitations will tend to mean that an upper quartile benchmark will require levels of efficiency that are, in practice, greater than the upper quartile*."

149. We agree that it is not appropriate to apply an upper quartile efficiency challenge in the case of the poorly performing secondary containment IED models.

150. Comparing the range of efficiency scores from these models with those from the base econometric models as illustrated in

151. Table 12, the scores from the IED models are considerably higher and have a wider range. This is another clear indicator that there are underlying issues with the models.

Table 12: Bioresources cost efficiency scores (green is lowest, red is highest)

Company	NES	SVE	NWT	SRN	WSH	WSX	SWB	YKY	ANH	TMS
Base efficiency	0.73	0.81	0.92	0.93	1.03	1.10	1.13	1.25	1.28	1.30
IED secondary cont. efficiency	-	0.76	0.49	1.38	-	1.24	1.71	1.10	1.00	1.07
IED tank covering efficiency	-	0.34	1.02	0.06	-	1.74	0.12	0.60	0.86	2.12

152. Ofwat calculated the efficiency scores at a company level rather than on a scheme level. In order to illustrate the variation in cost estimates at a scheme-level, we calculate the scheme-level efficiency scores and derive the upper quartile and median scores below.

153. Table 13 shows that there is a significant difference between the scores derived from the scheme level efficiency and the scores derived from the company level efficiency calculations. For secondary containment, the upper quartile from the scheme level efficiency scores is 30 percentage points less than Ofwat's calculated upper quartile. This wide variability in the efficiency scores stemming from a change in methodology for its calculation further indicates that the models are unreliable and should not be used for assessing costs. It also indicates that all companies have schemes with different levels of calculated efficiency, suggesting factors outside management control and unexplained by the models are driving cost variation.

[46] CMA, October 2015, Bristol Water plc - A reference under section 12(3)(a) of the Water Industry Act 1991 - Report, paragraph 4.222-4.223, SOC-3-0018.

Table 13: KPMG analysis of company level versus scheme level efficiency challenges

Ofwat PR24 efficiency challenge using company level efficiency scores						
		Secondary containment models			Secondary Containment Triangulated	Tank Covering
Percentile	Interpretation	SC1	SC2	SC3		
0	least efficient	1.638	1.827	1.691	1.715	2.123
0.25	lower quartile	1.338	1.194	1.217	1.273	1.201
0.33	lower third	1.255	1.098	1.127	1.193	0.968
0.5	median	1.145	1.043	1.080	1.084	0.729
0.67	upper third	1.058	1.006	0.993	1.026	0.429
0.75	upper quartile	0.966	0.951	0.914	0.944	0.287
1	frontier	0.516	0.488	0.481	0.494	0.065
Efficiency challenge using scheme level efficiency scores						
		Secondary containment models			Secondary Containment Triangulated	Tank Covering
Percentile	Interpretation	SC1	SC2	SC3		
0	least efficient	2.382	3.104	2.774	2.366	3.849
0.25	lower quartile	1.277	1.222	1.287	1.264	1.250
0.33	lower third	1.171	1.124	1.076	1.105	0.981
0.5	median	0.916	0.930	0.926	0.948	0.673
0.67	upper third	0.739	0.740	0.775	0.790	0.370
0.75	upper quartile	0.612	0.652	0.650	0.643	0.367
1	frontier	0.233	0.159	0.247	0.213	0.038

Note: Green highlighting shows the efficiency levels selected by Ofwat, i.e. upper quartile in secondary containment and median in tank covering.

5.2.8. Ofwat's approach to 'Other IED' Costs

154. Ofwat did not develop models for the remaining IED-related enhancement costs. Rather, it assessed them as one combined group.

155. The cost categories grouped together are distinct activities, potentially with their own cost drivers. For instance, control and monitoring costs are largely driven by the number of monitors, while permit application costs are driven by the number of sites with permits and liquor sampling by the required sampling frequency.

156. In the absence of top-down models for these Other IED cost areas, Ofwat applied the company-level modelled efficiency from secondary containment and tank covering to other IED costs, effectively assuming that company specific inefficiency is equivalent across secondary containment, tank covering and other IED costs. Our combined forecast cost for secondary containment and tank covering was £101m and the corresponding model allowance was £81m. This resulted in a company

level efficiency of 80.4% applied to our 'Other' costs. This was a new approach Ofwat took for the FD and one which we had no opportunity to make representations about.

157. There are two issues with this approach. First, the company level-modelled efficiency is derived from models that are not sufficient in explaining the variation of costs between companies as previously highlighted. Applying the efficiency derived from the flawed models on other IED costs propagates the underlying issues from the secondary containment and tank covering assessment to the other IED cost categories. Second, by applying the efficiency derived from secondary containment and tank covering models on the other IED cost, Ofwat assumed that the company specific inefficiency is equivalent across the different categories of IED costs. This assumption is flawed and not backed by any engineering rationale. The activities and costs that make up the Other IED costs are varied and different from the secondary containment and tank covering costs. It is implausible that all different IED cost categories would be subject to the same level of efficiency.

158. Our Other IED costs include for material additional opex for weekly sludge sampling, trade waste sampling and waste characterisation testing which amount to £30.5 million for AMP8. There are one-off capital needs which we include in our Other IED cost category which include:

- Modifying sludge reception points (£4.3 million)
- Tank modification (£2.4 million)
- Surveys relating to capital works (£4.2 million)
- Underground pipework testing (£3.1 million)
- OCU modification: £6.1m
- Gas testing and repairs of any leaks found (£2.8 million)
- Access road modification, physical protection and site security (£2.5 million)
- Fuel and chemical handling improvements (£0.8 million)

159. IED costs across companies are bespoke and exhibit variation that cannot be explained by a top-down approach. As such a deep dive approach should be taken for the IED schemes.

5.2.9. Remedy requested of the CMA

160. The top-down models used by Ofwat in the FD to determine our IED allowance are weak and, for the reasons explained above, **the variations between companies' costs and Ofwat's benchmark are unlikely to be due to differences in efficiency, demonstrating that the models are not appropriate.**

161. We therefore request that the CMA redetermines our IED allowance to reflect the detailed bottom-up evidence we provided to Ofwat with our DD Response, and which is appended to this Statement of Case, and accordingly allows in full our requested allowance of £172.1 million.

6. Error 2 – Enhancement assessments cases with arbitrary top-down adjustments

162. In this section, we set out the details of the errors made by Ofwat in applying (i) arbitrary top-down adjustments to two wastewater monitoring programmes subject to a deep dive assessment by Ofwat and (ii) arbitrarily, the water and wastewater company-specific challenge to areas of investment subject to Ofwat's shallow dive approach for assessing costs.

6.1 WINEP flow monitoring at sewage treatment works

163. **Ofwat was wrong to make an arbitrary top-down challenge to our flow monitoring costs (£21 million cost challenge).**

	£m requested	£m allowed by Ofwat in FD	£m gap
Flow monitoring at wastewater treatment works	69.9	48.9	21.0

164. As part of the statutory WINEP, there is a requirement to retrofit flow monitors at wastewater treatment works to support compliance with flow permit conditions. All overflows where passed forward flow (**PFF**) is controlled in such a way that any additional flow can spill to a storm tank or directly to the environment require certified monitoring of the PFF at the treatment works.

165. Flow meters at wastewater treatment works are typically either in-line where flows are pumped or level-based where flows arrive at the site under gravity. An in-line flowmeter measures the velocity of flow passing through a pipe downstream of a pump and can be used because the pipe will always be full of liquid. A level-based flowmeter measures the depth of liquid passing through a specially designed hydraulic structure and converts it into a flowrate using a calculation based on the dimensions of the hydraulic structure. The government's Monitoring Certification Scheme (**MCERTS**)[47] standard for flow monitoring requires appropriate positioning of the flowmeter, with certain lengths of straight pipe either side of it, if it is an inline flowmeter. Some types of flow monitor also require the ability to by-pass the flowmeter during cleaning and inspection. Such by-pass pipework is not installed routinely meaning that many retrofit installations of flow monitors require infrastructure to meet MCERTS requirements. At some treatment works sites the ability to meet MCERTS standards could mean a complete rebuild of the inlet works.

166. Opportunities for innovative solutions and cost efficiency are limited where MCERTS certification is required, as an independent MCERTS inspector must be satisfied that the installation meets all the requirements of the MCERTS specification.

167. Using knowledge of our sites we split our programme and costs between:

- new monitors to accommodate changed permit standards requiring us to log and transmit flow data every 2 minutes (rather than every 15 minutes as is currently required);
- simple monitor installations, and

[47] Gov.uk, Guidance - Minimum requirements for self-monitoring of flow: MCERTS performance standard, SOC-3-0019.

- more complex installations that require civil work in order to retrofit a meter.

168. The requirement to provide 2-minute interval reporting means existing instrumentation and telemetry installations on many sites need to be upgraded or replaced. We will also need additional internal capabilities to handle and manage the large increase in data the monitors will provide.

169. In our October 2023 Business Plan, we proposed in our flow monitoring programme to install monitoring at 251 of our treatment works in AMP8. Many of these sites (240) were investigated through an AMP7 WINEP investigation process to see if existing flow monitoring could be certified. Where we found they could not be, we proposed to replace with a new monitor in AMP8. Our forecast cost for this programme is £69.9 million.

6.1.1. Our approach to costing our programme

170. We explained our general approach to solution costing, benchmarking and efficiency in our Business Plan.[48] In addition to the AMP7 investigations, we surveyed many of our sites to assess the extent of investment needed to fit monitoring to the required standards. For those sites that we did not survey in detail, we carried out a desk-top assessment based on the capacity of the treatment works and our knowledge of the existing assets to allocate them to categories of complexity and size to support our assessment of costs.

171. As an additional cross-check we compared our costs for flow monitoring against allowances made by Ofwat at PR19 and found a material increase in our PR24 proposed unit cost per installation compared to Ofwat's PR19 simple unit cost model. A large increase in these costs was driven by the additional requirements to meet MCERTS standards and the implications of the new requirement for 2-minute interval data recording.

172. However, as a result of this finding we challenged our costs to be put forward in the Business Plan, reducing them by 10% below what was already our efficient cost estimate, which increased our level of risk.

6.1.2. Ofwat's cost assessment approach for the DD

173. Ofwat determined whether to conduct deep or shallow dive assessments of companies' flow monitoring proposals based on the materiality of the proposed costs and the unit cost of solutions compared to industry median unit costs. Our costs were both material and above median unit costs and so were subject to a full deep dive.

174. In the DD, Ofwat applied arbitrary top-down challenges of 10% to our proposed costs at each of the three assessment "gates" of:

- **Need**: based on a lack of comparability between WINEP and data table submissions on the number of schemes;
- **Best option for customers**; based on concerns over the assumptions we made in the split of our programme between categories of complexity; and

[48] Southern Water, October 2023, SRN15 Cost and Option Methodology Technical Annex, SOC-3-0020.

- **Cost efficiency**; because we had the highest overall requested totex across the industry and our complex (civils) installations were an outlier when compared with the indicative industry unit cost benchmark. Ofwat stated we had not provided sufficient and convincing evidence to justify the scale of the costs, including the assumed costs for IT server upgrades.

175. Ofwat's approach led to a 30% total cost reduction of allowances compared to the requested amount and an allowance at the DD of £48.6 million.

6.1.3. Summary of previous representations

176. Since our Business Plan submission in October 2023, the number of monitoring actions planned for AMP8 were altered to reflect the regulatory requirements resulting from on-going conversations with Defra and the EA. The changes in scope and costs were explained in our DD Response.

177. We provided responses to all of Ofwat's feedback in the deep dive challenges in our DD Response.[49] Firstly, we explained the numbers of flow monitors that fell in each category (as set out in paragraph 166 above) and we made changes to non-financial data table entries which had led Ofwat to misunderstand the scope of our programme. The scope of the programme and proposed costs remained substantially unchanged at £69.9 million, although there was a small increase in the number of sites from 251 to 254.

178. Secondly, we explained how we built the scope from site-specific information, following surveys and investigations carried out by a specialist in wastewater monitoring systems, and that we had developed a comprehensive understanding of the work required on each site. We set out the work involved at each site in our AMP8 programme.

179. To support our forecast costing we commissioned additional benchmarking of our costs relative to industry cost curves developed by Mott MacDonald and benchmarked our costs against those of five other water companies. This benchmarking supported that our proposed costs are more efficient than the industry benchmarks for the same scope.

180. **Ofwat's error: It applied an unjustified and arbitrary top-down challenge and failed to take into account the bottom-up evidence we provided.**

181. In the FD, Ofwat carried out a further deep dive. Ofwat removed the 10% challenges on need and best option for customers. However, despite the additional evidence put forward in our DD Response as to the appropriateness of our costs, and the additional benchmarking evidence that demonstrated that our costs were more efficient than industry benchmarks for the same scope, Ofwat **increased the cost efficiency challenge to 30% from the 10% it had applied in the DD.**

182. Ofwat's justification for an arbitrary 30% challenge to our costs included the following: "*We have significant concerns that a much-reduced programme now contains more complex solutions*." And "*Despite carrying out some additional cost benchmarking that it says demonstrates it is efficient compared to the rest of the industry, the company's costs for all three complexity categories are significantly above the indicative industry median, particularly for the 'permit-only' / 2-minute monitoring category. The company provides some evidence to justify higher allowances than the*

[49] Southern Water, August 2024, SRN-DDR-045: WINEP - Monitoring Enhancement Cost Evidence Case, SOC-3-0005.

industry median. However, for the FD we apply a 30% challenge on cost efficiency, which is half the gap between the median benchmark and the company request."

183. This is an arbitrary top-down challenge and does not take account of our detailed bottom-up evidence describing the scope of work required and the complexity of the sites which are key drivers of our requested allowance. Ofwat made an error of understanding. There was no substantive change in the size of the programme throughout the PR24 process and it remains that described in our detailed submissions to Ofwat. Ofwat's error of understanding was made based on a data table row entry where we had added both the number of units of both EDMs and flow monitors together in our Business Plan submission, but the costs for flow monitoring and EDMs were reported separately. As a result of a query from Ofwat we adjusted the data table to only show flow monitor numbers but the scope of work and costs remained substantially unchanged, bar the addition of three further sites at a cost increase of £0.1 million.

184. Ofwat failed to take account of the atypical situation arising from our AMP7 WINEP which means we have additional scope in our AMP8 flow monitoring programme compared to the rest of the sector. Flow to full treatment monitoring is a long-term programme, which started in AMP7 and will complete in AMP8. In our AMP7 WINEP we had 240 investigations and Ofwat allowed some funding at PR19 to carry out those investigations. However, we were allowed no funding for installing new flow monitors that any investigation concluded were needed. In its PR19 final determination, Ofwat allowed £97.3 million across the industry (2017-18 prices) for flow monitoring investments, only £0.241 million (2017-18 prices) of which was for Southern Water.[50] Ofwat's PR24 FD was made on the basis of a comparison with the rest of the industry which is an error due to the additional and legitimate scope of our PR24 flow to full treatment monitoring programme necessary to get to an AMP8 position that is the same as the rest of the sector, as is required by regulation.

185. In addition, the regulatory guidance on how to categorise flow monitoring activities is inconsistent and ambiguous, meaning that companies may have interpreted them differently. This would undermine the robustness of Ofwat's benchmarking of programmes by which it deemed our costs to be expensive.

186. In particular, there are differences between Ofwat's data table requirements and EA's WINEP driver guidance for sub-categories of flow monitoring activities. Ofwat asked us repeated queries about the flow monitoring data over the price review period, which illustrates the ambiguity and interpretation issues over categorising our flow monitoring costs.[51]

187. The ambiguity of Ofwat and the EA's guidance left room for interpretation. For example, the classification of a scheme as "complex" was tied to the construction of permanent civil structures by Ofwat, whereas complexity and associated cost could arise for other reasons such as working on third party land or implementing a flow monitoring scheme at a large sewage treatment works (as we explained in our DD Response).[52]

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[50] Ofwat, FM_E_WWW_flow-monitoring_FD, SOC-3-0041.
[51] See query responses: Southern Water, October 2023, SRN PR 24 Outbound Query Response OFW-OBQ-SRN-019, SOC-3-0042. Southern Water, November 2023, SRN PR 24 Outbound Query Response OFW_OBQ-SRN-091, SOC-3-0043. Southern Water, November 2023, SRN PR 24 Outbound Query Response OFW-OBQ-SRN-112, SOC-3-0044. Southern Water, March 2024, SRN PR 24 Outbound Query Response OFW-OBQ-SRN-252, SOC-3-0045. Ofwat, PR 24 Representation Outbound Query Form OFW-REP-SRN-075, SOC-3-0046.
[52] Ofwat stated in Southern Water, October 2023, SRN PR 24 Outbound Query Response OFW-OBQ-SRN-019, SOC-3-0042. that "'Civils' refers to the provision of MCERTs EDM or PFF monitoring that requires new permanent civils structure(s) to be built (for example hydraulic gauging structures – flumes or weirs). This excludes simple installations e.g. standard monitor installations, whereby a monitor is fixed to a chamber with standard fixings or those requiring only minor adjustments / modifications."

188. An example of this is where we are fitting a flow monitor at Sissinghurst WTW. A bypass is required on the flow monitor to allow for cleaning and maintenance. No civil works are needed because the flowmeter is above ground and yet the costs are high and it is a complex installation due to the existing site layout. We have not included this in any of Ofwat's or the EA's "civils required" categories as a result of it being for additional pipework and fittings which are above ground.

189. The ambiguity in the EA's guidance means there is a missing category for the likes of Sissinghurst WTW and a significant number of other flowmeters in our programme. The EA's categories for flow monitors are grouped under the driver it calls "U_MON4" as follows:

- *U_MON4a: Move AMP7 U_MON4 driver output to 2-minute flow monitoring*
- *U_MON4b: Move AMP7 U_INV2 driver output to 2-minute flow monitoring*
- *U_MON4c: PR24 U_MON4 from U_INV2 investigation including civils*
- *U_MON4d: MCERTS certified Flow passed forward flow monitor (no civils)*
- *U_MON4e: MCERTS certified Flow passed forward flow monitor including civils*[53]

190. For the great majority of our sites, the AMP7 investigations (known as U_INV2) revealed that we cannot use the existing flowmeter as it is not capable of meeting MCERT standards, and a new monitor needs to be fitted in AMP8. We had no specific U_MON4 actions in our AMP7 WINEP, unlike other companies. The EA has a category (U_MON4c) for such flowmeters where civil works are needed. However, if civil works are not needed, there is no appropriate EA category. We have included such sites in the category U_MON4b, which is more closely aligned to requirements simply for data handling costs, potentially categorised as "permit only" by Ofwat, and it is these costs that Ofwat stated in the FD as being atypically high. However, other companies may have allocated such sites differently to us meaning that Ofwat did not compare the same scope across all companies.

191. We are providing as part of this SoC a table of information in an excel spreadsheet which lists the sites where flow monitors are to be installed, the scope of work involved and the costs at each site. This collates the information we provided to Ofwat during the query process and which it referred to when making its FD decisions.[54]

192. **The remedy.** In applying an arbitrary 30% cost reduction to our requested allowance for flow monitoring, Ofwat did not properly take into account the bottom-up costs evidence that we provided in support of our scope and costs. As a result, the allowances set out in the FD are not sufficient to enable us to deliver the flow monitoring programme which we are required to install to MCERTS standards. Ofwat did not account for our programme being atypical compared to the rest of the sector. Ambiguous regulatory guidance may also have impacted Ofwat's ability to compare scope across companies.

193. We therefore request that the CMA redetermines our allowance for flow monitoring to reflect the bottom-up evidence we provided to Ofwat with our DD Response, and which is appended to this Statement of Case, and accordingly allows in full our requested allowance of £69.9 million.

[53] Environment Agency, November 2022, PR24 Supporting Guidance: WINEP Option Assessment Report and WINEP line requirements, SOC-3-0047.
[54] Southern Water, March 2025, U_MON4 sites and costs, SOC-3-0016.

6.2 WINEP monitoring at emergency overflows

194. **Ofwat was wrong to make an arbitrary top-down adjustment to the costs of our emergency overflows monitoring proposals (£28 million cost challenge).**

	£m requested	£m allowed by Ofwat in FD.	£m gap
Monitoring at Emergency overflows	92.8	65.0	27.9

195. As part of the statutory WINEP, there is a requirement to retrofit both event duration monitors and PFF monitors at emergency overflows to demonstrate that the overflows are only operating under permitted conditions. This monitoring equipment and installation must meet strict standards and each installation is required to be certified as satisfying MCERTS requirements. Due to the environmentally sensitive nature of our area we have a high number of "high priority" locations according to the EA's prioritisation definitions.

196. The same MCERTS guidance applies to monitoring PFF at emergency overflows as it does for monitoring flows at wastewater treatment works. MCERTS flow monitoring guidance prescribes that to be certified, flow monitors need, for example:

- Defined minimum of straight lengths of pipe of uniform section both upstream and downstream of the sensor
- Suitable depth of the channel being measured (where appropriate)
- The ability to by-pass the monitor to allow for cleaning and maintenance

197. The MCERTS requirements were published in 2020, after the PR19 price review.[55] Our asset standards for pumping stations and emergency overflows did not previously include these requirements meaning retrofit is complex and costly. In addition, monitoring PFF during emergency overflow operation on network sewage pumping stations emerged as a late requirement in the WINEP process,[56]

198. In our October 2023 Business Plan, we submitted a programme of works in line with the Secretary of State's August 2023 steer[57] that phased work at emergency overflows, with 25% of sites (128) to be addressed in AMP8 and the remainder in to be addressed AMP9. Within the short time available between the August 2023 steer and submission of the October 2023 Business Plan, we prioritised the AMP8 programme to ensure the highest profile sites were addressed first, according to prioritisation criteria set out by the EA. We indicated in our Business Plan that we would work with the EA to compile the final revised site list to meet the prioritisation criteria in the August 2023 steer which was provided less than 6 weeks before our Business Plan was submitted.[58]

[55] Environment Agency, March 2020, Performance Standards and Test Procedures for Continuous Water Monitoring Equipment, SOC-3-0021.
[56] Emergency monitoring WINEP guidance was issued on in October 2022 and the EA required WINEP submissions to be made including cost estimates, in November 2022. See Environment Agency, March 2025, List of PR24 guidance documents on SharePoint, SOC-3-0048.
[57] Environment Agency, August 2023, Water Industry National Environment Programme U_MON6 Phasing, SOC-3-0049.
[58] Southern Water, October 2023, SRN41 Wastewater WINEP Monitoring Enhancement Business Case, page 7, SOC-3-0022.

199. We carried out the full prioritisation exercise before we submitted our DD Response. As a result of this exercise, we made some alterations to the list of sites to be addressed in our AMP8 emergency overflows monitoring programme.

200. Subsequently, following the change in government in July 2024, Defra provided revised requirements for storm overflow monitoring on 21 August 2024, five working days before submission of our DD Response.[59] In order to meet these new requirements, we need to complete 50% of the overall programme in AMP8, doubling the scope of our programme originally set out in our Business Plan.

201. In our DD Response, we provided information to Ofwat explaining our estimate of needs and associated costs for a 50% programme to be delivered in AMP8 but we did not include updated costs to reflect a programme that had doubled in size in our requested allowances.[60] Rather, we recommended using the storm overflows uncertainty mechanism to accommodate these late changes and the related uncertainties over programme scope and costs.

6.2.1 Our approach to costing our programme

202. We explained our general approach to solution costing, benchmarking and efficiency in our Business Plan.[61]

203. We were not able to survey all our sites in detail in the time available. However, we used our detailed knowledge of the sites to sort them by size based on the permitted PFF, as follows:

- < 10 l/s – Small
- 10 to 100 l/s – Medium
- 100 to 1000 l/s – Large
- >1000 l/s – Very Large

204. We then categorised our sites by complexity of installation. Based on this categorisation, we developed costings as follows by category:

- Our low complexity site costings assume we can install new MCERTS-compliant Event Duration Monitoring (**EDM**) and flowmeter without any capital works requirements.

- Our costs for medium complexity sites assume that installation of a new flowmeter and associated bypass pipework to enable inspection and cleaning. They allow for over-pumping and/or tankering to enable such pipework to be installed whilst maintaining services to customers.

- Our costs for high complexity sites assume installation of a new bypass and pipework are required around the flowmeter to enable cleaning and maintenance, as well as installation of a new (or extension of the existing) inspection chamber, requiring excavation and additional civils work. The need to provide bypass pipework around all new meters to allow them to be removed for cleaning and maintenance is a significant contributor to the overall cost.

[59] Defra, August 2024, Water (Special Measures) Bill – Monitoring Emergency Overflows, SOC-3-0065.
[60] Southern Water, August 2024, SRN-DDR-045: WINEP - Monitoring Enhancement Cost Evidence Case, page 15, SOC-3-0005.
[61] Southern Water, October 2023, SRN15 Cost and Option Methodology Technical Annex, SOC-3-0020.

205. Some of our emergency overflow sites are highly complex and are in constrained locations, where any installation involves hazardous working in confined spaces. Our programme may be particularly problematic compared to that of other companies since many of our emergency overflows are located in coastal sewerage networks where pumping stations intervene in what was originally designed as untreated or partially treated discharge to the sea.[62]

206. We developed our costs for these items for each size band from cost curves which are based on historical data for our company and the industry.

207. Based on the methodology and assessment outlined above, our October 2023 Business Plan included actions at 128 sites in AMP8 at a cost of £38.9 million. As a result of the expanded programme for AMP8 (discussed above), our revised programme includes actions at 251 sites in AMP8, at an estimated cost of £92.8 million.

208. In response to the 30% efficiency challenge Ofwat applied at the DD, we commissioned a further benchmarking exercise which demonstrated our costs were lower than industry benchmarks for the same level of scope. We provided evidence of the benchmarking exercise with our DD Response and additional evidence in subsequent query responses.[63]

209. We attach a copy of the evidence of the detailed bottom-up costs and benchmarking exercise which we undertook at Appendix SOC-3-0052 of this Statement of Case.[64]

6.2.2 Ofwat's cost assessment approach

210. For its cost assessment purposes, Ofwat split our programme into three areas: i) installing event duration monitoring; ii) installing event duration monitoring which requires civil structures and iii) installing flow monitors with associated civil works.

211. Ofwat used median costs across the three different categories of activity to compare proposed costs across the industry. It carried out a deep dive where a company's proposed costs were both material and above an allowance calculated from the company's levels of activity multiplied by industry median unit costs in all three categories.

212. As our costs were above the industry median thresholds applied by Ofwat, Ofwat carried out a deep dive assessment of our programme. In the FD, Ofwat applied a 30% challenge to our costs.

213. The result of this reduction is that Ofwat allowed £65.0 million in the FD for these works at 251 sites, whereas our estimated cost for this scope of programme, which is twice the scale of that proposed in our Business Plan, is £92.8m, a gap in costs of £27.9 million.

[62] Please see our explanation for our cost adjustment claim for coastal wastewater costs where we explain the space and planning constraints that increase our base costs. These factors similarly affect our ability to make capital improvements in the same locations.
[63] See query responses: Ofwat, PR24 Representation Outbound Query Form Ref – OFW-REP-SRN-029, SOC-3-0050.; Ofwat, PR24 Representation Outbound Query Form Ref – OFW-REP-SRN-066, SOC-3-0051.
[64] Southern Water, August 2024, SRN-DDR-045 - [redacted]INEP - Monitoring Enhancement Cost Evidence Case, SOC-3-0052.

6.2.3 Ofwat's FD applied an unjustified and arbitrary top-down challenge

214. Ofwat's justification in the FD for a 30% challenge to our costs is as follows: "*While the company has provided some additional information, we still have significant concerns that the proposed investment is efficient. Therefore, we retain our DD approach for our FD and apply an adjustment*."

215. This is a poorly justified and arbitrary top-down challenge. Ofwat has not explained the basis for its residual concerns. Nor does Ofwat appear to have properly taken account of our detailed bottom-up evidence describing the scope of work required and our benchmarking evidence that support our requested costs (appended at Appendix SOC-3-0052). Further, the top-down unit cost benchmarking undertaken by Ofwat in the DD (which we understand that Ofwat took account of in determining an adjustment was required in the DD) did not take into account factors such as pumping station size and flowrates being measured. These are important factors for any benchmarking as flowmeters measuring high flows are more costly to buy and install than flowmeters measuring low flows. Failure to capture these factors means that the benchmarking was not prepared on an appropriate basis and will have produced unreliable results.

216. As a result, the FD does not provide us with sufficient and necessary allowances to deliver the emergency overflow monitoring which we are required by regulation to deliver.

6.2.4 Proposed remedy

217. Ofwat has not properly taken account of detailed bottom-up evidence which supported our requested allowances to deliver our storm overflow monitoring programme.

218. We therefore request that the CMA redetermines our emergency overflow monitoring allowance by reference to the bottom-up evidence we provided to Ofwat which demonstrates that the scope and cost of work we propose are efficient. This evidence is appended to this Statement of Case. Accordingly, we request that the CMA allows in full our requested allowance of £92.8 million to address 50% of our emergency overflow sites in AMP8.

6.3 Shallow dive arbitrary top-down adjustments

219. **Ofwat was wrong to make arbitrary top-down adjustments on the basis of poor models to all costs where it applied a shallow dive (£13.8 million).**

	£m requested	£m allowed by Ofwat in FD.	£m gap
Shallow dive water (10%)	36.20	32.58	**3.6**
Shallow dive wastewater (8%)	116.3	106.1	**10.2**

6.3.1 Approach to shallow dive

220. As discussed above, Ofwat took a risk-based approach to assessing enhancement proposals at PR24. Ofwat applied a shallow dive approach in general where expenditure was less than 0.5% of

water or wastewater totex and less than £10 million in total, although it applied discretion as to whether it carried out a shallow dive or a deep dive.

221. A shallow dive first involved verifying the need for investment (for example, whether the proposal resulted from following guidance for statutory improvement programmes). Ofwat then applied a challenge to the requested allowance based on a company specific efficiency calculation. As noted above, Ofwat used certain of its enhancement benchmarking models for PR24 to calculate the company specific efficiency applied to the requested costs.

6.3.2 Ofwat's FD

222. Ofwat made considerable changes to its methodology between the DD and the FD. It changed the models used to calculate the company-specific shallow dive efficiency challenge and reduced the shallow dive cap from 20% to 10%.

223. By following this approach to calculating a company-specific efficiency challenge, Ofwat amplified the problems associated with weakly performing top-down models (as discussed in Error 1 above) by applying the efficiency calculations from those models to unmodelled areas of investment outside them.

224. In the FD, the models Ofwat used to calculate the shallow dive efficiency challenge are shown in Table 14 below:

Table 14: Enhancement models used to determine company specific efficiency challenge in the FD

Wholesale water	Wholesale wastewater
Supply interconnectors	Continuous water quality monitoring
Demand	Storm overflows
Lead reduction	Phosphorus removal
Metering	Sanitary parameters
Raw water deterioration	Septic tank
	Growth at sewage treatment works
	First time sewerage
	Industrial Emissions Directive

225. To calculate the company specific efficiency challenge, Ofwat added together our requested costs over the modelled areas listed above and compared them with the total allowed from its benchmarking models. This approach resulted in company specific efficiency challenges of 10% in water (the cap) and 8% in wastewater which were applied to a number of areas of investment.

226. In addition, in its Storm Overflows assessment, Ofwat applied a company level efficiency challenge of 10% to our £48 million Budds Farm Havant SSO scheme – a £4.8 million cost gap. In error, Ofwat applied a 10% efficiency challenge, rather than the standard 8% rate across our wastewater programme.

227. In total, the company specific efficiency challenge reduced our cost allowances by £13.8 million (£3.6 million in water and £10.2 million in wastewater). This is a significant challenge to costs in areas that Ofwat did not review in detail.

228. **Ofwat's use of the results of weakly performing top-down models to challenge non-material costs is wrong.**

229. Ofwat's approach to calculating the company specific efficiency challenge for shallow dives raises a number of concerns:

230. First, for companies with a programme which is concentrated in an area where the model works least well and provides a more material challenge, this challenge, disproportionately, then impacted on all shallow dives. For example, we were found to be efficient in five out of the eight wastewater enhancement models listed above, had no costs proposed in a sixth and were found to be inefficient in only two areas, but that led to an 8% challenge being applied through the shallow dive. This is because for example, Ofwat's efficiency challenge of 20% was calculated for £100 million of our IED costs (as explained in section 5 above). This 20% challenge was applied to further unmodelled "Other" IED costs of £71 million. The total of £171 million of costs with a 20% challenge applied were used to calculate the shallow dive efficiency challenge. This, incorrectly, amplified the impact of one weak benchmarking model to both the unmodelled "other" IED costs and again through the company specific efficiency calculation to multiple other areas of investment. Similarly, in water, if the error in using the weakly performing supply interconnector model is removed and our costs are allowed in full, our water company efficiency challenge would reduce from 10% to 2%.

231. Second, there are marked differences in efficiency between different areas of modelled expenditure, which brings into question the appropriateness of the use of the benchmarking models to calculate company-specific efficiency challenges. For example, seven out of the 11 water and sewerage companies have shallow dive challenges that differ by at least 5% between their water and wastewater enhancement areas. It is unlikely that internal processes would result in such differences of true efficiency in delivering different capital improvement programmes within the same business.[65]It seems more likely that these are features of poor modelling.

232. Third, it makes arbitrary cuts in areas which Ofwat deemed us to be already demonstrably efficient.

233. For example, in WINEP drinking water protected areas, Ofwat used a median unit cost per WINEP action as a threshold to inform its decision as to whether or not to conduct a deep dive. Our proposals are for £22.8 million of investment. Ofwat calculated an industry median unit cost of £0.634 million per WINEP action. Our proposed costs are £0.506 million per WINEP action, which is 80% of the industry median unit cost. Ofwat concluded that since our costs were efficient it did not need to conduct a deep dive assessment of our proposals and instead applied a 10% efficiency challenge through its shallow dive approach, resulting in a £2.3 million challenge to our costs and an allowance of 72% of industry median costs. It is perverse that a cost challenge is applied through the shallow dive process in circumstances where Ofwat has already determined that our proposed costs are efficient such that there is no need for a deep dive.

6.3.3 The remedy

234. Our proposed remedy is that the company specific challenge is removed as it is not reliable and that the CMA allows an uplift of £13.8 million to our cost allowance, based on the detailed evidence underpinning our bottom-up costs which were provided to Ofwat.

[65] Ofwat, February 2025, PR24 final determinations: Expenditure allowances, page 108, SOC-1-0006.

7. Error 3 – Enhancement cases with base overlap

235. In this section, we address the errors Ofwat made in disallowing enhancement costs on the erroneous basis of an overlap with base costs. We present three enhancement programmes where this error was material and we are asking the CMA to rectify Ofwat's errors as part of the redetermination:

- Mains replacement for leakage reduction,
- Water resilience schemes transition funding, and
- A water supply scheme required to meet our supply demand balance.

7.1 Mains Replacement

236. **Ofwat was wrong to assert that much of our leakage reduction enhancement programme is funded through the base cost allowance (£103 million cost gap).**

	£m requested	£m allowed by Ofwat in FD	£m gap
Leakage reduction through mains replacement	123.2	16.3	106.9
Other leakage reduction	42.6	46.4	-3.8
Leakage reduction including mains replacement	165.8	62.8	103.0

The programme:

237. Our Business Plan includes a substantial mains renewal programme to replace 366km of mains in AMP8. 300km of this is an enhancement intervention selected through our WRMP24 process to deliver supply demand benefits and contribute to the Government's Environment Improvement Programme (**EiP**) target to reduce leakage.

238. The Water Resources Management Plan Direction (2022) puts a statutory requirement on water companies "*to contribute to a reduction in leakage by 50% from 2017-18 levels by 2050*".[66] Our AMP8 leakage targets are based on our WRMP24 roadmap to achieve ambitious leakage reduction and ODIs apply, which means we will be penalised if we miss our target.

239. Mains renewal is one of multiple interventions we are making to achieve our long-term target leakage levels. Our other WRMP24 leakage interventions include advanced find and fix, digitalisation / smart networks (to help us find leaks faster) and advanced pressure management which prevents swings in pressure bursting pipes, thus extending their asset life. Our strategy also includes identifying customer supply pipe leakage which we can help customers to fix once we find the leaks through our roll out of smart metering. Ofwat assessed our smart metering programme as a separate enhancement case.

240. Historically, we, and the rest of the industry, have delivered mains renewal for broader asset health purposes, paid for in the base cost allowance. This has been targeted to achieve water supply

[66] Gov.uk, April 2023, Guidance: Water resources planning guideline, SOC-3-0053.

contacts, mains bursts and water supply interruptions performance, as well as maintaining leakage at a steady rate. However, in AMP8, we are delivering 300km of mains renewal specifically for leakage reduction benefits. We are continuing to replace a proportion (66km, equating to a renewal rate of 0.1% per year) to address broader asset deterioration and water quality issues which we consider to be our base/asset health programme. The 300km we are delivering to reduce leakage requires a different strategy that includes complementary interventions. This means that the mains renewal activity and the associated costs deliver an enhanced level of service for customers and should be classified as enhancement.

7.1.1. Summary of previous representations

241. We explain our mains renewal programme and the evidence supporting our proposals in our DD Response[67]. Further information on our unit cost calculations is also provided.

242. The mains renewal we include in our base maintenance programme is driven by a suite of asset health metrics. It aligns with the outcomes-based incentive regime Ofwat applied in PR14 and PR19. We estimate we need to replace 44km (0.06% of our total mains length p.a.) in AMP8 to meet this driver, alongside undertaking other operational and asset maintenance activities that will enable us to perform against the basket of asset health outcomes metrics. We include an additional 22km (0.03% of our total mains length p.a.) for asset health improvement. This is an appropriate and affordable length within the context of the wider requirements on our overall base funding in AMP8 and is equivalent to a combined total of 66km or 0.1% of our total mains length per year.

243. Our unit cost per metre of mains replacement for leakage reduction is based on analysis of historical industry rates and a range of techniques including open cut, slip lining, pipe bursting and directional drilling. Importantly, it includes replacement of both mains and communication pipes to reduce leakage up to the property boundary. This is a different scope to any programme which seeks to address broader asset health metrics alone. We also make an allowance for factors such as provision of continuous water supplies to ensure the three-hour supply interruption threshold for planned interruptions is not exceeded whilst mains are replaced.

244. Recognising that the data in the DD showed our unit rate for mains replacement costs to be an outlier, we re-evaluated our cost estimation approach to derive a more efficient rate. Our approach included:

- A bottom-up unit cost model, incorporating a range of different mains rehabilitation techniques, with allowances for overheads and risk, consistent with our PR24 cost approaches as set out in SRN15 Cost and Option Methodology, Technical Annex (October 2023 Business Plan submission) and;

- A mains rehabilitation cost benefit assessment framework which is a tool allowing us to select the most appropriate rehabilitation techniques based on District Metered Area (**DMA**) characteristics and prioritise DMAs based on where we can achieve the most cost beneficial leakage reduction.

[67] Southern Water, August 2024, SRN-DDR-029: Water Resources - Demand (Leakage) Enhancement Cost Evidence Case, SOC-3-0003.

245. This approach allowed us to select a best value mains renewal programme with an overall unit cost of [redacted] metre, which has been independently assured by Jacobs. [68]

246. Our DD Response sets out our proposal for a total 366km of mains renewal of which 300km is enhanced mains renewal to achieve a leakage reduction benefit of [redacted] at a cost of £[redacted] million. In our October 2024 supplementary submission, we requested Ofwat use data that reflects companies' responses to both the totex efficiency challenge and outcomes regimes in place to avoid retrospectively penalising companies for responding to the regimes in place.

7.1.2. Ofwat's FD

247. In its FD, Ofwat agreed with how much mains renewal we should carry out, at 366km in total. However, it assumed a radically altered split between base and enhancement compared to our plan.

248. Ofwat assumed an overall base mains renewal rate of 312km in AMP8, i.e. 0.43% of our total mains length each year[69], assessed in three parts as follows:

- It used historical data from 2011-12 to 2022-23 to calculate a sector average 0.30% p.a. renewal rate (implicit allowance) delivered in the past through base costs and assumed that level would continue in AMP8.
- Ofwat then assumed a further increase should be delivered through base for any companies where it deemed data showed an asset deterioration in their mains network. For us, it assumed an additional 0.10% p.a. should be delivered, paid for by the base cost allowance, due to asset deterioration.
- Lastly, it assumed a further 0.03% p.a. increase to be delivered as base to improve asset health over the long term.

249. As a result, Ofwat considered that 312km mains renewal should be delivered through our base cost allowance in AMP8 (over four times more than the 66km we had proposed). This is made up oof 247km to achieve the sector average of 0.3% p.a., plus 44km to deliver the 0.1% p.a. asset deterioration challenge and a further 20.5km (0.03% p.a.) to improve asset health over the long term. Ofwat provides an uplift to the modelled base cost allowance of only £6.15 million relating to the 20.5km of mains renewal to improve asset health.

250. Ofwat allowed only £16.3 million of enhancement funding in the FD in respect of the remaining 54km of our proposed programme to achieve an AMP8 leakage reduction benefit of 1.37Ml/d. The level of the allowance was calculated by Ofwat based on its assessed length of enhancement mains renewal (54km) multiplied by its unit rate per metre replaced (£300/m).

251. Ofwat's approach in the FD has resulted in a shortfall of £107 million from our proposed enhancement costs in respect of mains renewal. We requested £166 million to deliver our entire leakage reduction programme. Ofwat assessed the activities split into mains renewal and other leakage reduction activities. To replace 300km of mains renewal to achieve leakage benefits, we requested £123 million in enhancement funding and Ofwat allowed £16 million creating a gap of £107 million. For the other leakage activities we requested £43 million and were allowed £46 million. This offset a small proportion of the mains renewal gap and resulted in a leakage enhancement gap

[68] Southern Water, August 2024, Assurance of WRMP leakage case, SOC-3-0066.
[69] Ofwat, December 2024, PR24 Mains renewal cost adjustment model PR24CA95, SOC-3-0023.

overall of £103 million. This is a substantial shortfall in the costs required to deliver our WRMP24 and provide customers with a sustainable supply of water for the long term.

7.1.3. Ofwat's errors in the FD

252. Ofwat has made three material errors in its assessment of mains renewal in the FD

- It incorrectly assessed the length of mains renewal that can be achieved through the base cost allowance;
- It erroneously increased the level of mains renewal paid for through the base cost allowance due to asset deterioration; and
- It failed to account for regional differences and the scope of our enhancement programme that impact on mains renewal costs, underfunding the efficient costs of our mains replacement by £[redacted] metre.

253. We provide further information on our case for each of the errors below.

7.1.4. Ofwat incorrectly assessed the length of mains renewal that can be achieved through the base cost allowance

254. Ofwat's assessment of "what base buys" overestimates the length of km of mains renewal the implicit base allowance funds. Before explaining the error in Ofwat's approach we set out some principles for estimating costs and activities funded through the base cost allowance.

Principles for understanding the level and costs of activities within the base cost allowance (the "implicit allowance")

255. Firstly, for there to be any assumed base cost allowance for an activity it must clearly fall within the definition of activities and cost categories covered by the base cost models. A clear definition ensures that companies accurately report the costs associated with the activity and that the cost definition and reporting are the same across companies.

256. Once it is established that the activities in question could be assumed to be covered by the base cost models, Ofwat and the CMA can apply principles for estimating the funding within the base cost allowance to cover that activity. This should include one or more of the following:

- Estimating the level of activity undertaken in the period informing the base cost models and forecasting this level of activity forward to the PR24 period; and/or
- Estimating the efficient funding allowed, i.e., the implicit allowance, for the activities in question in the period informing the base cost model and forecasting it forward to the PR24 period.

257. There is no one right way to apply the principles. By way of example, when explaining its approach to calculating an estimate of how much funding for network reinforcement was already allowed for in its base cost models, Ofwat stated in the FD that it took the average of two approaches because "*there is no perfect approach to estimating the implicit allowance*".[70]

[70] Ofwat, February 2025, PR24 final determinations: Expenditure allowances, page 60, SOC-1-0006.

258. The principles can be applied from an activity-led or cost implicit allowance perspective, or a combination of both. From an activity-led perspective, it may include:

- The level of activity all companies have carried out during the full period of historical data that is used to inform the base cost model statistical relationships
- The level of activity the base model upper quartile performing companies have performed in the five-year period in which they are setting the upper quartile catch up efficiency challenge
- The upper quartile level of the specific activity over a period

259. From a cost implicit allowance perspective, it could include:

- Calculating the impact on the base models of removing the spend on the activities being assessed in the input model data to work out a difference in cost allowance between when the activities under review are included and excluded.
- Calculating a top-down proportion of the base cost allowance using scale drivers to assign the base cost allowance to a subset of assets/activities.

260. In the network reinforcement example above, the two approaches which Ofwat averaged to calculate the implicit allowance in its FD were:

- Isolating each company's outturn cost data over the last 5 years and applying the calculated base cost efficiency ratio (efficient costs to outturn costs) to estimate an implicit allowance. This approach uses the principle of apportioning the efficient base cost allowance to a subset of activities; and
- Calculating the industry average level of expenditure on the activity in the model input data period as a proportion of total base expenditure over the same period. The implicit allowance for AMP8 is calculated as the same proportion of the base cost allowance for AMP8.

261. Ofwat did not use the method of removing spend on network reinforcement activities from the model, due to concerns related to potential cost allocation inconsistencies between companies in their reported data.

7.1.5. Ofwat's errors in calculating its implicit allowance for mains renewal

262. As explained above, in the FD, Ofwat used historical data from 2011-12 to 2022-23 to calculate a sector average 0.30% p.a. renewal rate (implicit allowance) delivered in the past through base costs and assumed that level would continue in AMP8.

263. Ofwat is wrong to assume the historical average from 2011 to 2023 is the single and only appropriate method for estimating the length of mains renewal base buys. Applying the principles above, there are alternative approaches to mitigate the risk Ofwat itself highlights that there is no one right way to estimate an implicit allowance, and yet Ofwat calculated an implicit allowance using one method alone for mains replacement.

264. The approach it has used is one way of estimating the level of activity all companies have carried out during the full period of historical data that is used to inform the base cost model statistical relationships. However, even within that it has made the following errors:

- Firstly, to align with the base cost random effects ordinary least squares modelling approach, which uses a Generalised Least Squares (**GLS**) estimator, a weighted average approach would be suitable. However, Ofwat has used a simple arithmetic average of the rates each company has undertaken.[71] Ofwat's approach does not account for the total lengths of mains each company has which is not adequate. Applying a weighted average approach using the sum total length of mains renewed through base and the sum of total length of potable mains over the full historical period reveals an average of 0.23% p.a.[72]
- Secondly, Ofwat in error failed to include the latest year of data when calculating the historical average rate of renewal in the industry, despite using the latest year of data in its base cost models. We have used a data set that includes all 13 years from 2011-12 to 2023-24 in the calculation of 0.23% p.a. above.

265. Additional methods that align with the principles set out above and Ofwat's approach in network reinforcement include considering the last 5 years' data. This is also consistent with Ofwat's approach for calculating the efficiency catch up challenge for wholesale water. There are two valid alternatives here, both using a weighted average approach: (i) using the industry average over the last 5 years; and (ii) using the average of the companies setting the base cost upper quartile efficiency catch-up challenge. These methods of calculation result in 0.11% p.a. and 0.12% p.a. respectively (using a weighted average approach).

266. Lastly, the upper quartile of mains renewals rate in the last 5 years can be used as a baseline to set a stretching but achievable targets for companies. The upper quartile for this period is 0.19% and Ofwat's proposed renewal rate implies a 58% stretch from the upper quartile. We suggest an industry stretch of 20% would be more appropriate as it is in line with Ofwat's targets for some performance commitment levels. We apply a 20% stretch to the 0.19% calculated as the upper quartile of the last five years resulting in a 0.23% p.a. level.

267. Table 15 summarises the mains renewals implicit allowance rates under these different approaches, as calculated by KPMG.[73]

Table 15: KPMG analysis of different approaches to calculating the levels of mains renewals in base

Method	Renewal rate
Ofwat's approach in FD: Sector arithmetical average based on historical data from 2011-12 to 2022-23	**0.30%**
Weighted average using full historical period, 2011-12 to 2023-24	0.23%
Weighted average using the last 5 years of data	0.11%
Weighted average using the last 5 years of upper quartile companies from water base models	0.12%
Upper quartile renewal rate for the last 5 years used as baseline plus 20% stretch	0.23%*
Average of last four methods	0.17%

[71] A GLS estimator uses a weighted average of the between and within estimators to calculated model estimates (Wooldridge, 2012)
[72] As an additional cross check, the median (which is Ofwat's preferred mid-point metric for efficiency scores) also results in a 0.23% p.a. level of historical renewal undertaken over the full 13 year historical period.
[73] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, SOC-2-0065.

268. The table above demonstrates that there are wide ranges of implicit allowances resulting from different methods of calculation. Ofwat's approach results in a value at the highest end of the range, demonstrating that adopting a single approach can lead to skewed results.

269. On the basis that there is no one right way to calculate an implicit allowance, a fair and proportionate approach would be for an average of all four alternative approaches to be adopted. This also aligns with Ofwat's approach to using a range of methods for calculating the implicit allowance for network reinforcement. This results in a 0.17% p.a. renewal rate as an implicit allowance.

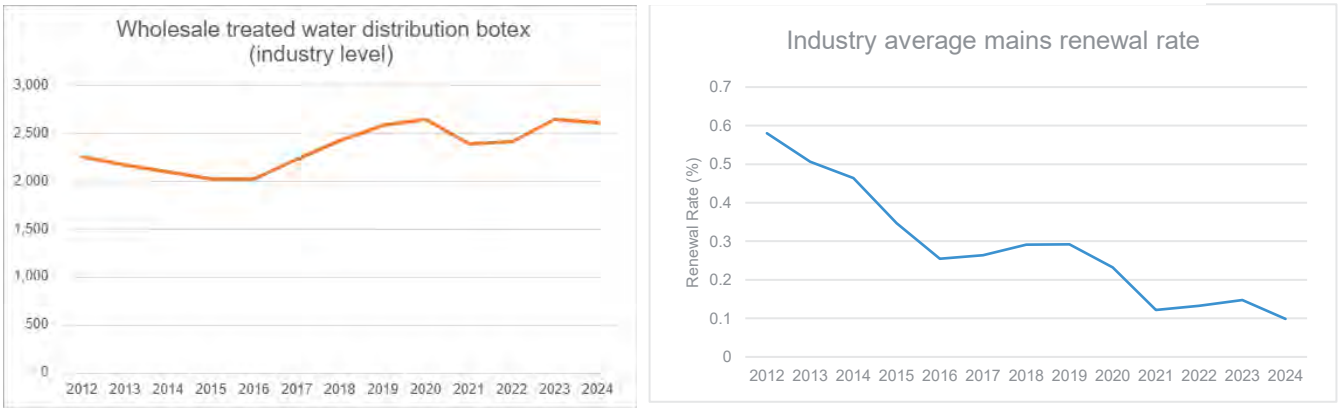
7.1.6. Implications of Ofwat's assumption of a high implicit allowance

270. The base cost allowance which the FD provides is not sufficient to accommodate the costs of a 0.30% sector average level of mains replacement, without compromising on other critical areas of activity, which would be to the detriment of customers. In addition, as a result of the FD we are required to absorb the cost to deliver an additional 0.10% of mains renewals per year as Ofwat considers we have allowed mains condition to deteriorate. This effectively penalises us (and other companies) retrospectively for delivering outcomes-focus activities in alignment with the PR14 and PR19 outcomes-based frameworks.

271. We refer to a paper by Economic Insight: Issues with Ofwat's Approach on "customers not paying twice" which is provided at Appendix SOC-3-0024.[74] A copy of this paper was also provided to Ofwat as part of our DD Response. This paper discusses the Ofwat PR24 approach to enhancement expenditure and explains the error in Ofwat's assumption that requested enhancement funding is covered by base cost allowances.

272. Figure 5 shows the trend in historical treated water distribution base expenditure and average mains renewals rate funded through base at the industry level over the same period. This Figure demonstrates that the level of expenditure has slightly increased over time whilst the mains renewal rate (one of the activities funded through base expenditure) has decreased over the same period. In the totex and outcomes regime, companies have chosen to undertake different activities to meet their obligations.

Figure 5: Trends in expenditure and base-funded mains renewals 2012 – 2024



[74] Economic Insight, August 2024, Issues with Ofwat's approach on "customers not paying twice" A report for Southern Water, SOC-3-0024.

273. In the FD Ofwat imposed a PCD to deliver its assumed implicit base length of mains renewal, which serves to ringfence base funding for mains renewal. As explained in Chapter 5: Price Control Deliverables, Ofwat was wrong to apply PCDs to base funding because:

- The imposition of PCDs on base essentially ring-fences proportions of companies' botex allowances for specific activities at specific unit rates. This represents a marked change from Ofwat's longstanding approach to allowing companies flexibility in the use and delivery of base expenditure.
- The ring-fencing effectively reduces the remaining non-PCD botex allowance, reducing companies' scope to redirect expenditure to most effectively deliver outcomes and benefits. The reduction in flexibility from the imposition of PCDs on base expenditure undermines a central element of the outcomes and totex framework, to the ultimate detriment of consumers and the environment.
- Ofwat sets botex allowances using top-down modelling assessments and specific cost adjustments. Unlike for enhancement, botex allowances are not linked to specific activities or schemes. Rather, they are intended to fund the high-level outcomes to "provide a base level of service to customers".

274. The level of mains replacement each company has delivered over the last ten years has been within the context of an outcomes-based framework and in reaction to the priorities that emerged during the period. It should not be retrospectively used as a measure of companies over or under performing in mains renewal.

275. Ofwat's approach also does not consider the counterfactual: i.e. the impact on customers had companies prioritised mains renewal and not undertaken other activities or invested in other areas; the outcomes that would have arisen; costs companies would have incurred and the impact that could have had on the base cost models; and what its own view would have been had companies argued that mains renewal should have taken priority over other requirements.

276. In AMP7 we have spent over £400 million (17%[75]) above our AMP7 base cost allowance to turnaround our water service performance through a systematic programme of hazard reviews and interventions across our water supply works. This was the clear AMP7 priority, whilst we maintained our network performance through optimising our operations rather than replacing mains.

277. In addition, at PR19 we requested £33.1 million enhancement funding to meet the Ofwat challenge to reduce leakage by 15% over AMP7. In its PR19 final determination Ofwat did not allow any enhancement funding for additional leakage reduction.[76] This means we had to fund our ambitious AMP7 leakage reduction activity from base.

278. Ofwat's approach in successive price reviews has stretched the base cost allowance, forcing us to find more efficient ways of delivering on our duty to maintain an efficient and economical system of water supply within our area and to ensure that all such arrangements have been made for maintaining our water mains and other pipes.[77]

[75] Ofwat, December 2019, PR19 final determinations: Southern Water final determination, page 34, section 3.2, SOC-3-0025.
[76] Ofwat, December 2019, PR19 final determinations: Southern Water final determination, page 36, section 3.3, SOC-3-0025.
[77] Duties paraphrased from Water Industry Act 1991, Section 37, SOC-1-0002.

7.1.7. Ofwat erroneously increased the level of mains renewal paid for through the base cost allowance due to asset deterioration

279. Ofwat used a flawed approach to assess companies' distribution mains asset deterioration since PR09 which has resulted in an erroneous increase in base driven mains renewals requirements.

280. In the FD, Ofwat assumed that base costs allowed for 0.30% p.a. renewal rate for eleven companies. For the remaining six companies, including Southern Water, Ofwat applied an additional allocation to base for what Ofwat deems as asset deterioration since PR09. Using a proxy for asset condition that was last applied at PR09, Ofwat determined the additional rate as the difference between the PR09 and PR24 percentage of mains in asset condition categories 4 (poor) and 5 (very poor). We explain how these categories were derived below.

281. This incorrectly imposed an increase to our base renewal rate of 0.10% per year (to increase it to 0.40% in total paid for through the base cost allowance). Based on our efficient unit rate (£[redacted] per metre) this is an additional £29.7 million[78] to be funded from our base cost allowance. Ofwat made the following errors in its assessment of the increased renewal rate:

- the approach of using 'condition grade' to assess changes in mains renewals condition is inconsistent with regulatory precedent and past guidance;
- the mains cohort condition data Ofwat used to inform adjustments in companies' base mains renewal rates is unreliable, inconsistent and misleading.

7.1.8. How Ofwat assessed mains condition at PR09

282. In 2006 in the lead up to PR09, UKWIR[79] proposed an approach to assessing the condition of water mains using 5 categories (from 1 - Excellent to 5 - Very Poor). As a proxy to undertaking what would be significant work to sample and survey mains to assess their condition, the UKWIR report presented an approach to estimate mains condition. It categorised different water mains 'cohorts' according to the frequency the pipes burst. It did so by comparing features such as pipe material and location to split up the lengths of mains and then allocating them a condition grade based on a definition of cohort burst rate per km of main. This grading methodology was adopted by Ofwat for PR09. Companies submitted their water mains cohort condition data to Ofwat using the UKWIR burst rate categorisation approach at PR09.

283. Following PR09, in 2010 UKWIR published "The Asset Inventory: A Simplified Alternative Approach"[80]. The report concluded that serviceability indicators are adequate to hold companies to account for maintaining their assets and that regulatory reporting of condition grades should be discontinued. Ofwat did not request any further data submissions of water mains condition grade data, and instead, throughout AMP5 (2010-2015) relied on a basket of 'serviceability' indicators for monitoring the asset health of water infrastructure (underground) assets. [81]

[78] Calculated as 0.1% of total mains length multiplied by our unit cost of £416 per metre
[79] UK Water Industry Research, Review of water mains serviceability indicators and condition grading - Volume 2 mains condition grading, SOC-3-0027.
[80] UK Water Industry Research, The asset inventory: A simplified alternative approach, SOC-3-0028.
[81] See Ofwat, Reliability and availability, SOC-3-0029, which says "Serviceability is a regulatory tool that measures and confirms that capital maintenance outputs have been delivered for customers and the environment. Performance is measured through 20 indicators which are grouped into to four sub-services:

284. Ofwat in error at PR24 reverted to using this discontinued metric from 15 years ago to assess mains asset health. Ofwat applied this as the single source of information on this aspect.

7.1.9. Ofwat did not provide sufficient time for robust data provision

285. Ofwat did not set out in its PR24 draft methodology that it would require companies to collect and submit mains cohort condition data. The first time companies were made aware of this requirement was in Ofwat's PR24 Final Methodology table guidance published in August 2023, which gave companies only two months to calculate and submit the relevant data (in data table CW20 – Distribution mains condition) in October 2023. Additional guidance was provided on the completion of the CW20 table[82]. At this point Ofwat indicated that it planned to *"use this data as a check as to whether renewals are keeping pace with deterioration and to determine whether it can provide any further insight across companies of emerging asset health risks".* Ofwat was not transparent at the time that it would be used as a means to require additional activities to be delivered through base cost allowances.

286. In addition, given that companies had not been required to submit mains condition grade data since 2009, there are likely to be issues with data consistency and comparability even for a company which had maintained comparable records. It is likely that companies' data submitted in table CW20 in October 2023 may not have been wholly consistent with the previously published PR09 request.

287. There are distinct differences between the UKWIR report used to inform PR09 and the PR24 CW20 data table guidance which cast doubt on the comparability of the data sets used by Ofwat. A comparison of key features of the 2006 UKWIR guidance and Ofwat's PR24 CW20 condition grading guidance demonstrates that there are material differences, for example:

- Condition grading methodology is based on aggregations of mains with similar characteristics, termed cohorts. The PR24 CW20 guidance specified that each cohort must be arranged so that its expected total number of bursts per year is within a tolerance of +/- 50% (as far as is practicable) of the nominal size based on the internal diameter of mains shown below.

Table 16: Main types and expected bursts per year in Ofwat's PR24 approach

Type of mains	Nominal expected total number of bursts per year per cohort
Mains up to 320 mm internal diameter	2.5
Mains 321 mm internal diameter and over	1.0

- This use of pipe diameter is in contrast to the PR09 UKWIR guidance[83] which indicated that companies should categorise mains as 'significant' and 'non-significant' mains with discretion given to companies to identify these based on the consequence of failure. This shows that

serviceability water non-infrastructure (for example water treatment works) (5 indicators)
serviceability water infrastructure (for example underground water mains) (6 indicators)
serviceability for sewerage non-infrastructure (for example sewerage treatment works) (3 indicators)
serviceability sewerage infrastructure (for example underground networks sewers) (6 indicators)

[82] Ofwat, August 2023, PR24 Final Methodology submission table guidance – section 3: Costs (wholesale) – water, SOC-3-0030.
[83] UK Water Industry Research, Review of water mains serviceability indicators and condition grading - Volume 2 mains condition grading, page 56-57, SOC-3-0027.

data cannot be reliably compared between PR09 and PR24.

288. Ofwat's categorisation of mains cohort condition is based only on burst rates (see Table 17 below).

Table 17: Ofwat's data table CW20.2 mains condition grading definitions [84]

Grade	Description
1	Excellent Bursts average up to 125/1000km/annum over five years, (equivalent to 1600 metres or more between bursts over the five-year period).
2	Good Bursts average greater than 125 up to 250 burst/1000 km/annum over five years, (equivalent to less than 1600 metres down to 800 metres between bursts over the five-year period).
3	Adequate Bursts average greater than 250 up to 500 bursts/1000km/annum over five years (equivalent to less than 800 metres down to 400 metres between bursts over the five-year period).
4	Poor Bursts average greater than 500 up to 1000/1000 km/annum over five years (equivalent to less than 400 metres down to 200 metres between bursts over the five-year period).
5	Very Poor Bursts average greater than 1000/1000 km/annum over five years (equivalent to less than 200 metres between bursts over the five-year period).

7.1.10. Ofwat's analysis is flawed

289. As shown above, Ofwat's method in the FD for assessing mains condition is simply a measure of mains burst rate. While mains renewals can impact burst rate, they are not the only way to alter them. Ofwat's methodology directly links "condition" to mains renewals. Other activities that companies take to reduce burst rates include:

- Pressure management: Companies actively manage their networks to reduce bursts through pressure management techniques. This includes operating "calm networks" to control transient pressures in pumped sections of the network.
- Relining: Ofwat's definition of mains renewal only considers structural refurbishment of mains as sufficient to extend asset life. Relining activities also reduce burst rates, but these techniques are not recognised by Ofwat as mains renewal activities adequate to change the mains age band.[85]

290. Consequently, companies can improve asset condition (as defined by Ofwat's approach) of a water main from "poor" at PR09 to "adequate" at PR24 without replacing assets, but rather through changing the way they operate the network, as described above. In this context, Ofwat's approach is

[84] Ofwat, August 2023, PR24 Final Methodology submission table guidance – section 3: Costs (wholesale) – water, SOC-3-0030.
[85] Ofwat, August 2023, PR24 Final Methodology submission table guidance – section 3: Costs (wholesale) – water, SOC-3-0030.

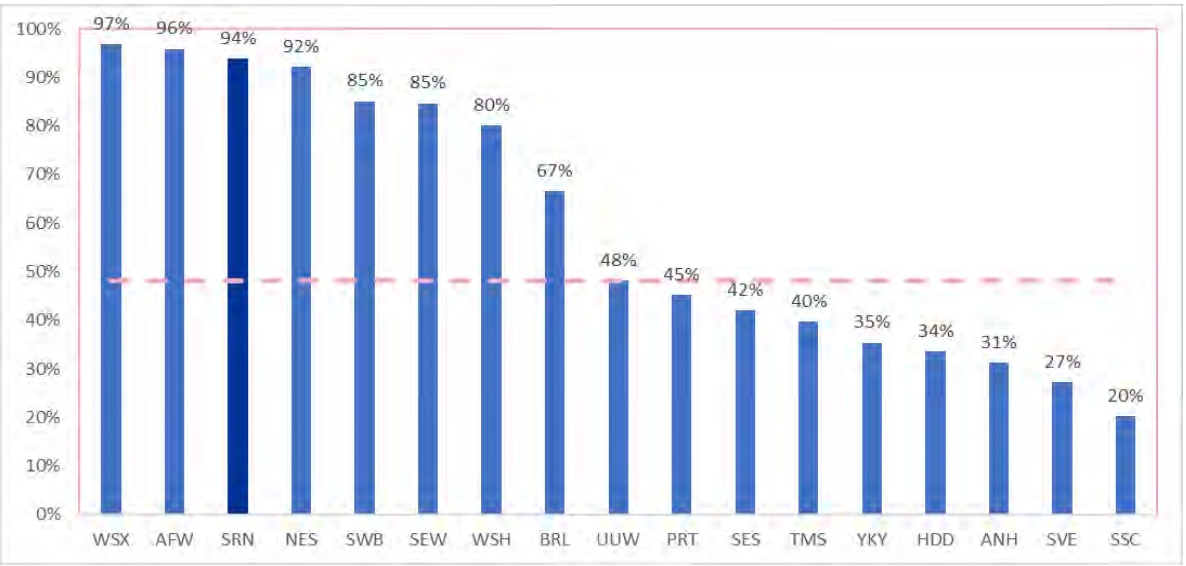
flawed in using an apparent deterioration in asset condition to require companies to undertake additional mains renewal activity out of base allowances.

291. Ofwat's guidance for completing mains condition data[86] set tolerance levels at +/-50% of the nominal expected burst rate. The aim of setting a tolerance level was to ensure that companies did not artificially aggregate or mask low condition grade mains lengths with lengths of higher-grade mains within cohorts. High levels of compliance with the tolerance range are therefore essential to ensure that there is comparability between company data and data can be relied upon.

7.1.11. Varying data quality calls into question its use in making material cost adjustments

292. Ofwat's analysis in the FD failed to take into consideration the tolerance compliance data to validate, assess accuracy, or ensure comparability between company data. There is a significant range in tolerance compliance in the data companies submitted, as shown in **Error! Reference source not found.**Figure 6 below. More than half the industry data is less than 50% compliant, by length of main.

Figure 6: KPMG analysis of % compliance within tolerance (including 'no' bursts) (as % of total km)



Source: KPMG analysis[87] of Ofwat's water mains asset condition data published 20 February 2025 [88]

293. Our mains cohort data exhibits 94% compliance, falling within the expected burst range indicated by Ofwat. This level of compliance is significantly higher than the percentage of compliance within tolerance reported by South Staffs and Severn Trent, which was less than 30% (as shown in Figure 6 below). Comparing relative proportions of condition grades across companies is meaningless

[86] Ofwat, August 2023, PR24 Final Methodology submission table guidance – section 3: Costs (wholesale) – water, SOC-3-0030
[87] KPMG, March 2025, Analysis of components of Ofwat's PR24 Final Determination cost assessment, SOC-2-0065.
[88] Ofwat, March 2025, CW20 Distribution mains condition analysis, SOC-3-0031.

unless there is high compliance with the tolerance level – this was not the case at PR24.

7.1.12. Ofwat used retrospective regulation to penalise companies for responding to the totex and outcomes regime

294. The totex and outcomes framework in previous price reviews was designed to incentivise companies to find the most effective ways of meeting the asset health outcomes including leakage reduction, supply interruptions and mains repairs. Alternative approaches to large scale mains replacement were effective in doing so. Where they were not effective, companies were penalised through the outcomes regime with financial penalties applying to underperformance. It is not appropriate that companies are penalised again at PR24 through reduced cost allowances in the FD, in particular where it was not transparent to companies at the time they were determining how best to meet the asset health outcomes.

295. Other demands on base funding, particularly in the last two AMPs, and the advent of stretching PCs and ODI penalties, have limited the scope for companies to replace their mains network at a sustainable rate without materially overspending Ofwat's base cost allowance. Deferring investment in some of our longer life assets, including our mains, in that context is entirely rational but cannot be continued indefinitely. This is clearly a sector-wide issue as illustrated by the AMP-by-AMP halving of replacement rates from AMP5 to AMP6 and from AMP6 to AMP7. Ofwat's approach at PR24 further exacerbated the pressure on our base funding.

296. By uplifting the base rate of renewal to 0.40% p.a. for companies with higher-than-average proportion of mains in what it considers to be condition grades 4 and 5 Ofwat has used condition as a single measure of performance. Condition grade is only one way to consider asset health. Overall, burst rates and performance against PCLs both indicate that asset health has improved over time, not deteriorated.[89] Base cost allowances have been spent flexibly, and companies have invested where required. In some cases, this has reduced mains renewals rates but has not impacted service levels delivered to customers, as is to be expected from an in-period outcomes-based framework.

297. Ofwat has not previously determined capital maintenance allowances or required activity levels based solely on condition grades and they are not an appropriate basis for capital maintenance funding. True asset condition is very hard to determine in buried assets (as is the case here) and Ofwat has therefore used previous incentive regimes to support achieving a range of asset health metrics through AMP6 serviceability and ODI penalties on bursts, leakage and supply interruptions ever since.

7.1.13. Ofwat's unit cost for mains renewal does not support leakage reduction.

298. Ofwat failed to account for regional differences and the scope of our enhancement programme that impact on mains renewal costs, underfunding the efficient costs of mains replacement by [redacted]

[89] Ofwat, January 2022, PR14 Review, SOC-3-0032, p.12 shows a 10% reduction in mains bursts over the AMP6 period

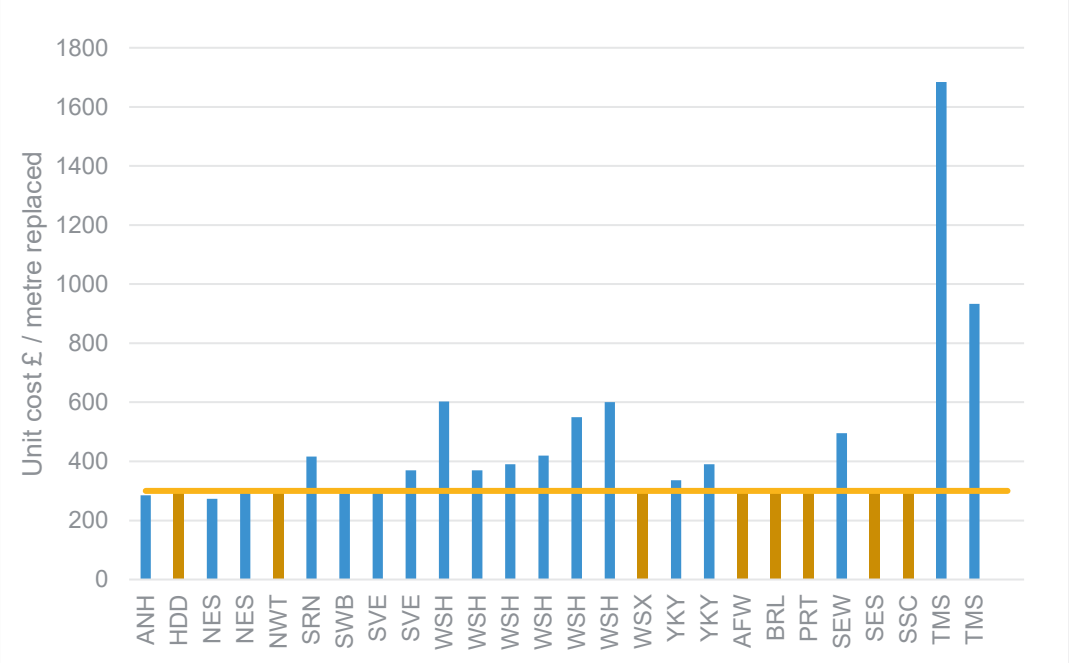
299. Ofwat's assessed unit rate for a metre of mains renewal is £300, significantly lower than our unit rate of [redacted] for our leakage reduction programme. There are a number of errors with Ofwat's approach to assessing the unit rate, which are set out below.

7.1.14. Errors underpinning the median cost: 1) Reinforcing Ofwat's DD view based on partial information

300. Ofwat derived its unit rate from the rounded median (£298) of the submitted unit costs from all companies except Thames Water. In the DD Ofwat assessed the unit costs based on 11 companies' data and applied a median unit rate of £292/metre. In the FD, Ofwat calculated the median rate using data from 16 companies, with several companies providing more than one rate. The companies highlighted in the chart below included Ofwat's calculated DD median unit cost as part of the costings presented in their responses to the DD. This means the data is not a true reflection of actual mains renewal costs, but rather a reinforcement of the unit rate Ofwat said it would allow in the DD. Companies may have reflected Ofwat's rate in response to the incentive to provide "compliant" plans in order to avoid penalties for lack of ambition as defined in Ofwat's assessment of Business Plan quality and ambition in the DD.[90]

301. Removing the companies that included Ofwat's DD unit rate in their responses to the DD from the calculation increases the median unit cost to £380 / metre.

Figure 7: Companies' mains renewal unit cost rates (£/metre) submitted in responses to the DD.



[90] Ofwat, July 2024, PR24 draft determinations Quality and ambition summary, SOC-3-0054. shows that Ofwat was likely to adjust its assessment between draft and final determinations. Its definition of "ambition" was a company proposed stretching but achievable levels of service at an efficient and affordable cost to customers.

7.1.15. Errors underpinning the median cost: 2) Regional cost differences

302. Ofwat's assessment did not take account of legitimate regional differences that mean that efficient costs vary between companies. Mains renewal activity is materially impacted by many of the same factors as the costs of laying new pipes such as water supply interconnectors described in section 5 above. Ofwat allowed Thames Water a unit rate of £1,180/metre for renewals carried out in its London operating area based on its "unique circumstances". However, Ofwat did not evaluate whether there were any other regional variations that should be taken into account in assessing the unit rate.

303. For example, South West Water is a company operating in one of the lowest hourly wage cost areas of the country, and yet its unit rate was assessed as the median rate. Similarly, three of the companies that submitted Ofwat's median value in their responses to the DD (Affinity Water, Portsmouth Water and Sutton and East Surrey) are in the south east area. As a result, companies with rates likely to be most comparable to Southern Water's due to their proximity to our region were not represented in the median.

304. Further, within the median calculation four companies are listed more than once as they have rates that vary e.g., Welsh Water has six rates included in the median which range from £370/metre to £600/metre. This illustrates that a standard unit cost per a metre replaced is not consistent even within one company.

7.1.16. Errors underpinning the median cost: 3) Scope differences

305. Ofwat applied the median rate without considering the activity and scope of each company's mains renewal programme. Our programme is not optimised to address end-of-life mains renewal and the total programme costs are greater than had we developed an asset health-based renewal programme.

306. Our mains replacement programme is materially different as its primary purpose is to reduce leakage, whereas the design of a base programme focusses on a wider asset health optimisation approach. We have designed a mains renewal programme to achieve 4.30Ml/d of leakage reduction to support the Government's EiP. This is why we consider it to be enhancement activity and not base. We have assessed the available leakage reduction activities and devised an optimal programme for achieving leakage reduction. The 300km mains renewal enhancement programme includes costs for the length of mains replaced and for additional activities to maximise the leakage benefit. This includes communication pipe replacements and providing customers with a continuous supply whilst replacing mains which will both maximise leakage benefits and minimise disruptions. Excluding the communication pipe replacement would reduce the unit cost by around 13% to £[redacted]/ metre but the leakage benefit is also reduced by a third.

7.1.17. Proposed remedies

307. In order to address the errors Ofwat made in the FD, we request that the CMA redetermines our allowance for mains renewal on the following basis:

308. The application of a base replacement rate of 0.17% per year funded through the base cost allowance for asset health-related activity. This is the average implicit allowance using a number of

valid alternatives to Ofwat's flawed and single approach to calculating the level of activity undertaken in the historical model input data period. Following this correction, 122 km of renewal in our programme would be considered to be funded through the base cost allowance in AMP8. However, given that our base plan envisages that only 66km will be subject to asset-health related activities alone, whereas for the residual 56km to be funded through base we will be undertaking the full scope of activities required to reduce leakage, we request the CMA to uplift the base cost allowance for these 56km by the difference between the mean unit cost for base renewals used by Ofwat (£300 per metre) and our efficient cost for our leakage reduction programme (£[redacted] per metre). Taking this approach would allow an uplift of [redacted] million to the base cost allowance.

309. Our requested remedy is for the CMA to allow an efficient and appropriate unit cost for our region and the scope of activities in all 300km mains renewal programme which focuses on leakage reduction. Our efficient unit cost for each of these 300km is £[redacted] per metre renewal. The first remedy above covers 56km of our leakage reduction programme. This leaves 244km to be funded through enhancement to support our leakage reduction programme. Funded at our efficient cost of £[redacted] per metre means an additional £[redacted] million. This £[redacted] million should replace the FD allowance from Ofwat of £16.3 million for mains renewals relating to leakage reduction.

310. In total, the remedies we propose the CMA makes for Ofwat's errors in mains renewal result in an increased cost allowance of £91.6 million made up of £6.5m base uplift and an increase from £16.3 million to £[redacted] million as enhancement allowance.

7.2 Water resilience enhancement

311. **Ofwat is wrong to assert that AMP8 transition funding should be disallowed (£59.7 million cost gap).**

	£m requested	Allowed by Ofwat in FDs	£m gap
Water Supply Works resilience transition	59.7	0	59.7

312. In our DD Response we requested an enhancement allowance of £435 million to meet resilience improvement needs. In the FD, Ofwat allowed only £345 million of the requested allowance. Ofwat applied the largest reduction to three water supply works (**WSW**) schemes at [redacted] and Weir Wood. Our requested funding includes an allowance for what is known as "transitional costs" spent in 2023-25 at each of the three WSWs in preparation for and as an early start on the required AMP8 improvements. It is these costs in particular that Ofwat did not allow for in the FD. We set out below why Ofwat was wrong to disallow these AMP8 transitions costs.

7.2.1 The programme

313. Our WSW resilience programme accounts for £356 million of the requested allowance of £435 million. This programme concerns five schemes where investment is required to reduce the risk of interrupting water supplies to customers due to the treatment works being unable to accommodate deteriorating raw water quality. The schemes will also increase resilience to forecast growth. Both of these factors are outside of [redacted] control.

314. In the FD, Ofwat accepted the two largest schemes met the criteria for its large scheme gated process. We do not discuss these further in this SoC because we accept the mechanism that Ofwat proposed in the FD to manage risks around scope and cost uncertainty inherent in large schemes working on live operational sites. The remaining three schemes were not included by Ofwat in the large scheme gated process.

315. The driver for investment at our WSW is a resilience need that qualifies for enhancement expenditure. We propose funding for each WSW to improve long-term service resilience and provide enhancements to support future water quality needs. These investments are required by Final Enforcement Orders (**FEO**) from the DWI. We received these FEOs after the PR19 final determination, and so the costs to meet the DWI requirements were not included in our PR19 final determination. The justification of need and details of dates when we received the FEOs are explained in our Supply Resilience Cost Evidence Case for the DD Response (SRN-DDR-027)[91] which are appended in Appendix SOC-3-0001.

316. The cost gaps for the three WSWs that Ofwat did not include in a gated process are shown in Table 18. The largest proportion of the cost gap is the AMP7 transition funding that Ofwat did not allow in the FD.

Table 18: Water resilience requested and Ofwat allowed cost

WSW	Requested £m	FD allowance £m	Total Gap £m	Transition cost adjustment £m
[redacted]	27.7	14.8	-12.9	-11.3
[redacted]	47.2	26.1	-21.1	-18.2
Weir Wood	74.3	39.7	-34.6	-30.2
Total	**149.3**	**80.6**	**-68.7**	**-59.7**

7.2.2 Ofwat's cost assessment approach for the DD

317. In its DD Ofwat assessed the WSW upgrades (at four of the five sites) in a deep dive and applied adjustments based on need, best option for customers and cost efficiency. The [redacted] and [redacted] sites received respective challenges of 72% and 77%. The most material challenge on the [redacted] request was due to what Ofwat deemed insufficient evidence of cost efficiency with a challenge of 51%. For [redacted] it was a need challenge of 59%.

318. The Weir Wood WSW scheme was not included in our October 2023 submission.

7.2.3 Summary of previous representations

319. In our DD Response we explain that we use detailed bottom-up costing to ensure our proposals present an efficient cost request. We provided additional evidence on the need for the solutions and

[91] Southern Water, August 2024, SRN-DDR-027: Supply Resilience Enhancement Programme Enhancement Cost Evidence Case, SOC-3-0001.

our costing approach including external assurance in our DD Response. This included the case for the Weir Wood WSW scheme. We supplemented our Business Plan cost information with further benchmarking, including shadow estimates from an independent third party to test our internal costing approach, which demonstrate our cost estimates are efficient[92].

320. In calculating the proposed enhancement costs, we assessed the level of base cost implicit allowance for the assets in the scope of this programme, in recognition that there will be an implicit allowance in base costs for replacing WSW assets over the long term. We did this even though we are replacing the assets with those having an enhanced capability to meet changing future needs. We calculated the total implicit allowance for the three sites to be £41.9 million in 2022/23 prices. Our estimates of implicit allowance for each site are provided in Table 19.

Table 19: Implicit capital maintenance cost allowance by site

Water Supply Works	Implicit allowance (£m)
[redacted]	17.5
[redacted]	22.2
Weir Wood	2.2
Total	**41.9**

321. We included in our DD Response transition costs (within the total funding request) for activities we will deliver in the final year of AMP7 which contribute towards meeting the requirements of the DWI. In total we requested £149 million to deliver resilience enhancement at the [redacted] and Weir Wood WSWs. £59.7 million of this was for AMP7 transitional costs of £11.3 million, £18.2 million and £30.2 million at [redacted] and Weir Wood respectively, being the amounts we need to spend to advance the AMP8 enhancement objectives that are over and above the base implicit allowance.

322. We have had discussions with the DWI to ensure that the work on our key WSW schemes is part of a targeted and agreed long term strategy. In the summer of 2022, we finalised our end-to-end site strategic reviews which defined the best long-term solution and roadmap for each site.

323. We sought assurance from an independent expert, Milo Purcell, formerly Deputy Chief Inspector of the DWI. This independent assurance was sought in the context of ongoing and escalating regulatory enforcement action by the DWI that included potential further enforcement action. This involved the review of the development of the strategic reports for each site, to provide our Board and Executive with confidence that the final strategies are fit for purpose and will deliver against the objectives.

324. Our water resilience request is for the efficient funding over and above the implicit cost allowance to cover the cost to upgrade and replace assets. This work is needed because the existing assets are no longer fit for purpose and to meet DWI notice periods which have pressing AMP8 deadlines.

[92] Mott MacDonald, July 2024, PR24 Enhancement case review - 4 Sites Enhancement Case, SOC-3-0040.

7.2.4 Ofwat's FD

325. In its FD Ofwat disallowed around 45% of the total requested funding for the three WSW schemes. It made a c.40% adjustment on need as it did not accept the transitional funding on investment in 2023-25 as enhancement and it then applied a further 10% (£9 million) adjustment due to concerns over our evidence on cost efficiency. A breakdown of Ofwat's adjustments for each WSW is provided in Table 20.

Table 20: Ofwat's adjustments to the three WSW sites

WSW	Request (£m)	Adjustment (%)	Adjustment (£m)	Allowed (£m)
[redacted]				
Need	27.7	40.6%	11.3	14.8
Cost efficiency		5.9%	1.6	
Total		46.6%	12.9	
[redacted]				
Need	47.2	38.6%	18.2	26.1
Cost efficiency		6.1%	2.9	
Total		44.8%	21.1	
Weir Wood				
Need	74.3	40.7%	30.2	39.7
Cost efficiency		5.9%	4.4	
Total		46.6%	34.6	

326. Ofwat's reasons for disallowing the transitional costs were:

- The funding is not bringing forward work, planning or early starts from AMP8; and
- There is insufficient evidence the activities have not been previously funded.

327. Disallowing the requested funding resulted in the addition of £59.7 million to our AMP7 totex overspend, which would then be subject to PR19 cost sharing rates.

328. **Error: Ofwat has failed to assess the evidence of need and is incorrectly disallowing transition costs**

329. In its PR24 Final Methodology, Ofwat explained that it would allow companies to bring forward some planned investment from 2025-2030 to AMP7. It would allow transition funding for 2023-24 and 2024-25 to "*allow companies to make an early start on where early delivery helps reduce overall delivery costs in 2025-30 and helps earlier delivery of customer and environmental benefits*".[93]

330. A transition funding approach has been used by Ofwat in successive price reviews. Its use incentivises companies to mitigate the impact on the supply chain of the cyclical nature of investment

[93] Ofwat, December 2022, Creating tomorrow, together: Our final methodology for PR24 Appendix 9 Setting expenditure allowances, page 74, SOC-3-0010.

caused by the five-year regulatory process, starting early on investment for urgent future requirements without having to wait for Ofwat's final determination when the reason for investment is not in doubt. Ofwat states "*In the context of our price control framework, it is important to ensure that companies are not financially incentivised to delay making investment*."[94]

331. Ofwat set out in its PR24 Final Methodology the criteria for eligibility for transition funding allowances. [95] Those relevant to our proposal may be summarised as:

a) not for investments with deliverables in 2020-25;
b) not for investments previously funded;
c) not for base cost investments;
d) with sufficient and convincing evidence to justify an early start; and
e) for expenditure relating to schemes included in a final WRMP24 or PR24 WINEP submission, where early delivery helps reduce overall delivery costs in 2025-30 and helps earlier delivery of customer and environmental benefits; or
f) (for 2024-25 only) for expenditure relating to early design and planning of large, non-routine investments; or
g) (for 2024-25 only) for investment with early statutory deadlines in the next price control period.

332. Ofwat's reasons for not accepting the transition funding proposal for our three WSWs are inconsistent with its approach to other transition allowances in the FD. The rejection of transition funding is inconsistent with Ofwat making enhancement allowances for expenditure on the same programme of investments when the funding requested falls in 2025-30. By disallowing the associated transition funding, Ofwat has set a precedent that undermines the purpose of transition funding and incentivises delay in investment until there is regulatory certainty at future price controls.

333. In its FD, Ofwat explains where it allowed and did not allow transition funding.[96] For other similar transition funding proposals made by other companies, Ofwat states "*We have assessed the request as part of our cost assessment process and set the allowances to start in year 2025-26*", [97] or it made transitional allowances in 2024-25 where the investment did not qualify for 2023-24 transition funding. This shows that rather than disallowing the investment altogether, Ofwat rephased the investment proposed. It is in very few cases, all of them relating to Southern Water, where Ofwat rejected transition funding.

334. In assessing the AMP7 investment at the three WSWs to be base costs or funded in previous price reviews, Ofwat did not properly take into account evidence we provided that we had spent over the calculated implicit allowance of £49 million. This is the calculated implicit allowance for capital maintenance at the three WSWs. Ofwat's deductions applied through its deep dive are therefore not appropriate.

335. The transition funding for [redacted] and Weir Wood provides for a step change in investment to protect customer supplies from new water quality challenges and facilitate the further investment in AMP8 at these sites. Not only is climate change causing more intense rainfall and

[94] Ofwat, December 2022, Creating tomorrow, together: Our final methodology for PR24 Appendix 9 Setting expenditure allowances, page 116, SOC-3-0010.
[95] Ofwat, December 2022, Creating tomorrow, together: Our final methodology for PR24 Appendix 9 Setting expenditure allowances, page 115-118, SOC-3-0010.
[96] Ofwat, February 2025, PR24 final determinations: Expenditure allowances, page 291-293, SOC-1-0006.
[97] Ofwat, February 2025, PR24 final determinations: Expenditure allowances, page 292, SOC-1-0006.

associated increases in turbidity, but higher temperatures extend the growing period for algae. This is combined with more stringent water quality requirements and the need to treat a range of chemical and pharmaceutical products that would not be met by replacing like for like treatment processes.

336. The three WSWs were all commissioned in the 1960s and 1970s and it is no longer efficient or effective to repair these dated processes. The costs of maintaining compliant treatment processes have risen significantly over recent periods and major updates are now required. We propose programmes of investment that combine replacement of assets with additional scope of treatment to meet the emerging raw water and future growth challenges, i.e. the programmes go well beyond a like for like replacement of assets and so fall within enhancement activities. The optimal solutions are for significant rebuilding with new technologies. Some of the assets we are replacing are, as a result of remedial work undertaken in the last ten years, not at the end of their asset lives.

337. Ofwat has allowed other companies additional funding for such activities, such as the allowance for Thames Water for improving north east London resilience at PR19 and PR24 which include significant sums at a water supply works.[98]

338. The detailed evidence of the need for the transitional funding and why it is enhancement, over and above any reasonable base cost implicit allowance, was provided to Ofwat in SRN-DDR-027 and is appended in Appendix SOC-3-0001. In summary it shows the recent expenditure, what we have spent base funding on, the extent of the cost gap and the enhancement scope.

339. In addition, we set out below our position in relation to Ofwat's FD deep dive comments for each of the three sites Ofwat has not allowed transitional funding, demonstrating that Ofwat made an error in its disallowing these costs.

340. [redacted] – Supplies 246,000 customers. The raw water quality treated at this site is deteriorating (including increasing risk of cryptosporidium and other micro biological hazards) and upgrades are needed to remove these newly emerging risks. The investment in AMP7 was not for the same scope items as those replaced which were no longer fit for purpose to meet the emerging risks. The orthophosphate dosing, replacement of rapid gravity filters and the clearwater tank all provide an upgrade to address the emerging challenges. We have spent £47.5 million in AMP 5 and 6, and in the first 3 years of AMP 7 we have spent £8.7 million. We provided details of our investment in the SRN Outbound Query Response OFW-OBQ-SRN-232.[99]

341. A transitional allowance of £11.3 million for [redacted] WSW was rejected in the FD. Ofwat's deep dive challenge:

- **Ofwat deep dive in the FD:** Claims £3.1 million is base overlap for end-of-life assets.
  - **Our position**: We have adjusted our request for base overlap, accepting that there is an element of overlap. However, the implicit allowance is not sufficient to fund the assets, and they are not like for like assets as we need to enhance the works to meet new treatment requirements.

- **Ofwat deep dive in the FD**: Rejected our request for a transitional allowance of £11.3 million (encompassing the £3.1 million) for this site on the basis that it considers there is not sufficient or convincing evidence that the transitional request is appropriate.

[98] Ofwat, December 2019, PR19-final-determinations-Thames-Water-Cost-efficiency-additional-information-appendix, SOC-3-0064.
[99] Southern Water, SRN Outbound Query Response OFW-OBQ-SRN-232, SOC-3-0057

- **Our postion:** We must maintain operation of the site while upgrades are delivered as there is no alternative supply to customers, extending the time it takes to make the necessary improvements. The AMP7 and AMP8 enhancement is part of a phased delivery programme to upgrade the works in compliance with the DWI notice and to increase resilience for customers.

- **Ofwat deep dive in the FD:** The company has not provided evidence that the transitional request is bringing forward the work, planning or early starts for the next price control (2025-30). Ofwat expects deliverables achieved in the current price control should enable or bring an early start to the deliverables over PR24 to qualify for transition funding.
  - **Our position:** We have started delivering the phased enhancement programme in AMP7, and it will continue into AMP8. The scope for both AMPs is to meet the same need which is water treatment that mitigates the water quality deterioration and provides customers with a reliable water supply for the future. Work will be completed in line with the timescales provided in the DWI enforcement order which includes a schedule of work for specific scope items to be delivered in each year between 2023 and 2031 inclusive[100].

342. [redacted] – this site is a single source of supply to 169,000 Southern Water customers and 25% of the works output is a critical supply to South East Water's (**SEW**) customers. As explained in SRN-DDR-027, the WSW was built in stages, and the throughput of the works is restricted by the empty bed contact time within one of the processes to ensure effective treatment of pesticides. The site is under a DWI notice SRN-2022-00001, to achieve improvements to the overall functioning and resilience of the site. As part of our WRMP24 requirements the site needs to be enhanced to provide an output of 65 Ml/d of river-derived water until 2050. Ofwat has allowed for the AMP8 proportion of the request but not the AMP7 (transition). The investment needed in AMP7 to comply with the DWI notice was Granular Activated Carbon (**GAC**) and Rapid Gravity Filtration (**RGF**). This was updated to a FEO in February 2023 to deliver the work outlined above by September 2029, commission by 2030 and decommission the existing RGF assets by 2031[101]. Due to the criticality of the site and the need for increased output in the future we designed a scheme that would meet the DWI requirements and enhance resilience and throughput at the site.

343. A transitional allowance of £18.24 million for [redacted] WSW was rejected in the FD. Ofwat's deep dive challenge:

- **Ofwat deep dive in the FD**: The company has not provided sufficient or convincing evidence to address concerns from the DDs that the 2023-25 request qualifies for transitional allowance.
  - **Our position:** The AMP7 and AMP8 enhancement need is part of a phased approach to addressing water quality risks and enabling the site to meet increased demand in the future.

- **Ofwat deep dive in the FD**: There is no evidence that the request is to fund deliverables for the next price control (2025-30), or the investment enables an early start to PR24 enhancement.
  - **Our position:** The enhancement need is being met by a phased delivery of actions that comply with the DWI requirements and enable the works to continue to supply water to customers whilst the new assets are installed. This is early start of the

[100] DWI, February 2023, SRN_2022_00010_[redacted]FEO (002), SOC-3-0059
[101] DWI, February 2023, SRN_2022_00001_[redacted]_FEO, SOC-3-0058.

delivery programme at the works.

- **Ofwat deep dive in the FD:** The company has not provided sufficient and convincing evidence to address concerns from DDs that activities have been previously funded.
  - **Our position:** In SRN-DDR-027 we provided Ofwat with a table that listed AMP5 and AMP6 investments at the [redacted] site (see table 5 in SRN_DDR-027). The activities were funded through base and cost £2.8 million in AMP5 and £10.3 million in AMP6. In AMP7 we have spent £17.8 million to mitigate water quality risks and comply with DWI requirements. This is a step increase in water quality processes and the activities have not been funded previously.

344. **Weir Wood** – This site is currently out of service due to water quality issues and has a notice (SRN-2022-00002 V2) from the DWI prohibiting its use and requires a rebuild to resolve the water quality issues. When operational the works supplied over 100,000 customers in our region and also fed an export of water to SEW. The rebuild is being delivered in three phases to comply with the DWI enforcement order[102]. Phase 1 will deliver 7Ml/d by 2026, and phase 2 will increase output to 14Ml/d in 2028. Phase 3 will integrate the two phases into one 21Ml/d plant by 2030. At the time of submitting our DD Response we had spent £7.4 million on the site upgrades during AMP7, which is far more than the implicit allowance of £2.2 million that we have calculated. The new process design is different to the historical design to treat raw water at an enhanced level and deal with the bacteria risks that the old plant could not address. By the end of the final phase, the new Weir Wood WSW will have the capacity to fully utilise its abstraction licence of 21Ml/d with a new asset life of 40-50 years.

345. A transitional allowance of £30.24 million for Weir Wood WSW was rejected in the FD.

- **Ofwat deep dive:** The company has not provided sufficient or convincing evidence that the 2023-25 request qualifies for transitional allowance.
  - **Our position:** The driver for the enhanced funding is to bring the works back into supply through addressing water quality issues and to deliver WRMP24 requirements through increasing the reliable throughput of the works. The site is currently out of service and a full rebuild is required that will be delivered in three phases over AMP7 and AMP8.

- **Ofwat deep dive:** There is no evidence that the request is to deliver enhancement in the next price control.
  - **Our position:** We have a WRMP requirement to deliver a minimum of 6 Ml/d by April 2025 from this site, however due to the increasing risk from bacillus bacteria which infected the whole site it has been decommissioned, and we need to rebuild a new works, capable of reliably treating the water source. Once phase 3 is complete the works will provide a reliable 21Ml/d. Prior to the water quality deterioration, we were able to produce a peak licence capacity of 21Ml/d and an average of 14Ml/d. [redacted]

- **Ofwat deep dive:** The company is not funding activities that were already funded in historical price controls (including historical DWI notices).
  - **Our position**: In AMP6, we invested £11 million of Capex to provide important improvements to contact tanks and the provision of Bisulphite dosing to improve

[102] DWI, December 2024, Southern Water Services Limited – Weirwood Multi Phase Reference: SRN-2024-00016 V1, SOC-3-0055.

production outputs. Our aim was to reduce outages caused by water quality issues and return to output levels on a par with the licence allowance. Unfortunately, the presence of Bacillus persists as explained in SRN-DDR-027. The request for a step increase in the treatment processes is not the same activity.

346. Ofwat's view is that the requested funding does not provide deliverables or enable early start for AMP8 schemes. As highlighted in our Query response (SRN Outbound Query Response OFW-OBQ-SRN-232[99]), we are not making a like for like replacement and this investment will lead to resilience upgrades at all three sites that are not overlaps with base. We are requesting the £149 million transitional funding for our [redacted] and Weir Wood sites for enhancement needs not met by long-term base funding.

347. This is an error in that it does not consider the drivers for the AMP7 investment at each WSW.

7.2.5 The remedy

348. The FD incorrectly disallows transitional costs in relation to investments for resilience at three WSW without proper assessment of the evidence for their need and scope. The request is over and above any base cost allowance. It is for site upgrades that are triggered by raw water quality deterioration and long-term resilience needs. An enhancement allowance for these transitional costs is appropriate as the relevant investment constitutes a phased programme of delivery for providing a step increase in treatment processes in AMP8.

349. In order to correct this, we request that the CMA redetermine our enhancement allowance to allow transition funding for AMP7 expenditure required as early start for delivering AMP8 resilience improvements to the three WSW to the amount of £59.7 million.

7.3 Water supply scheme (£21 million gap)

350. **Ofwat is wrong to assume the scope of our Smock Alley supply scheme was funded in PR19 (£21 million cost gap)**

	£m requested	Allowed by Ofwat in FD	£m gap
Supply scheme: Smock Alley	21.3	0	21.3

7.3.1. The programme

351. A need for new water supply has been identified through our WRMP24. Smock Alley is one of 26 supply schemes that are part of our WRMP24 solution for closing supply demand deficits. [redacted] The scheme includes a new borehole that requires demolition, reinstatement, refurbishment and installation of new treatment processes.

352. At PR19 we included a different (more narrowly focussed) WRMP scheme for this source that would be treated at an existing works with some process upgrades. However, we have not delivered the

PR19 scheme as further appraisal of the scheme during the first phase of the delivery process indicated that the quality of the water from the groundwater source required more complex treatment processes than had been scoped for during the concept design. As a result, the PR19 scheme would not comply with Drinking Water Regulations and it would not be providing our customers with a sustainable source of supply for the long term, which is the primary purpose of WRMPs. Had our PR19 scheme been requested at PR24 Ofwat would have made a cost allowance of £2.2 million. We note that Ofwat considered customer protection was needed in PR19 for our more material WRMP schemes but it did not name the PR19 Smock Alley scheme as needing such protection for non-delivery.

353. As general background, the WRMP process requires multiple schemes to be identified and appraised as options to include in optimisation modelling to select a solution. Schemes that are assessed as feasible are scoped using desk top studies and the best available information.

354. The scheme costs are based on a concept design. It is not practicable or feasible to fully scope and cost the options as the time to do this for all 141 supply schemes (listed in Table 4 of the Southern Water WRMP24[103]), and more than 1,000 options in total, would severely delay the production of the plan. The WRMP is a 50-year plan repeated every five years, and it is not appropriate to fully scope each scheme with each iteration.

355. During delivery, the first phase is always to carry out detailed studies and investigations to confirm the scope and costs. This can lead to cost increases as assumptions in the concept design do not always reflect the actual scope.

7.3.2. Our approach to costing our programme

356. The Smock Alley scheme costs for PR24 are based on a detailed cost estimate. We evaluated the notional WRMP solution alongside alternatives. In total 18 options were taken through our risk and value process and three were taken forward for detailed costing. Mott MacDonald provided third party assurance[104] and concluded there was a good level of cost certainty. The WRMP24 element breakdown is compared to the WRMP19 scope in Table 21. The additional scope increases the total cost from £3.75 million to £21.3 million.

Table 21: Smock Alley scope elements WRMP19 scheme compared to WRMP24 scheme

WRMP19	WRMP24
Groundwater abstraction - new borehole	Groundwater abstraction - new borehole
Replace rapid gravity filters with new pressure Filtration plant	New Pressure Filtration (for iron and manganese removal).
Demolition of old RGF plant	Demolition of old RGF plant
Flood resilience measures	Site wide civils and infrastructure
Not included in scope	Disinfection- Upgrade
Not included in scope	Orthophosphoric acid dosing

[103] Environment Agency, February 2025, wrmp24_template-tables_sws_2024_07_04_semd_checked-signed_ea_feedback_2-copy, SOC-3-0033.
[104] Mott MacDonald, Smock Alley-Cost Assurance Submittal-R&V 3.2-R1, SOC-3-0056.

Not included in scope	New/ refurbished washwater treatment process
Not included in scope	New high lift pumps/re-lift pumps
Not included in scope	New/refurbished pH correction
Not included in scope	New Oxidation and pre-chlorination
Total cost £3.8m	Total cost £21.3m

7.3.3. Ofwat's cost assessment approach in the DD

357. The Smock Alley scheme was not included in our October 2023 Business Plan submission and therefore was not assessed in the DD, as we were at the time still proceeding with the PR19 investigation ahead of scheme delivery and our WRMP24 was still under development.

7.3.4. Summary of previous representations

358. In our DD Response, we explained that Smock Alley was one of two schemes that required additional funding at PR24 due to scope and cost increases with the PR19 scheme. Our Smock Alley and Rogate schemes were included in our WRMP19 and PR19 plans delivering a 3.12Ml/d and 1.6Ml/d benefit respectively.

7.3.5. Ofwat's FD

359. Ofwat assessed our WRMP24 supply schemes that are not classed as interconnectors through a combination of econometric modelling and deep dive analysis.

360. However, Ofwat rejected our Smock Alley [redacted] groundwater scheme through a "non-enhancement" deep dive on the grounds of duplicate funding.

361. In its deep dive Ofwat stated that "*The scheme was originally funded as part of the company's 2020-2025 supply programme to deliver a water available for use (WAFU) benefit of 3.1Ml/d by 2024. This scheme is currently delayed, and the expected benefit has not been delivered*". This assessment failed to take into account, as explained in our DD Response[105] that the scheme scope had significantly changed, and the costs increased from £3.8 million to £21 million. Our WRMP19 scheme costs were based on a notional solution and the actual scope to deliver the scheme and provide a reliable water supply to customers was significantly higher than expected.

362. Ofwat also stated in the FD that "*Changes to scheme option and any resulting changes in scope are determined to be intrinsically linked to existing aged assets which represent at least 50% of the new costs proposed in the 2025-2030 period, which is considered an overlap with base funding. Where scope changes occur, companies are still expected to deliver schemes and associated benefit, and may utilise funding mechanisms such as cost sharing if necessary*".

[105] Southern Water, August 2024, SRN-DDR-028: Water Resources – Supply: Enhancement Cost Evidence Case, SOC-3-0002.

363. This assessment falls short as it does not reflect the justification for the scope and related cost increase, namely, that the scheme needs a higher degree of treatment. We are not due to replace the existing assets as part of our capital maintenance programme. The additional enhancement expenditure is to provide for a step increase in the level of treatment to protect customers and comply with drinking water quality standards.

364. Ofwat provided funding for our [redacted] (this is referred to as Petersfield in our WRMP) for which we requested £12.54 million. The final allowed costs for the Rogate scheme were based on the outputs of Ofwat's econometric modelling, and it allowed £7.19 million.

365. The Rogate scheme is one of five schemes that Ofwat assessed through a deep dive and deducted £8.95 million from our total supply scheme allowance for PR19 non-delivery. Ofwat applied its modelled low complexity unit cost (£0.71 million/Ml/d) to the schemes and multiplied by the combined PR19 benefit for all five schemes (12.6Ml/d). It also applied a 15% deduction for base overlap through its deep dive assessment. Ultimately this was immaterial to the outcome because Ofwat used a modelled allowance which was below the deep dive allowed cost.

366. Ofwat's approach to the scope changes for the Rogate and Smock Alley AMP7 schemes was inconsistent. Both schemes have been re-evaluated during the early stages of delivery and found to require new treatment processes. Ofwat accepted the case for the Rogate scheme with only a 15% adjustment for base overlap but fully rejected the Smock Alley scheme claiming at least 50% of costs were base overlap. As set out above, the overlap with base is not correct. However, even if it were. Ofwat should then have allowed for funding in the region of £10 million for the elements that it considered were above the base overlap to be consistent with its approach to Rogate.

367. Our preliminary studies concluded that the PR19 Smock Alley groundwater scheme is no longer feasible as it would not provide appropriate treatment to meet drinking water standards. For WRMP24 we have designed a new scheme utilising the same source with the same benefit in Ml/d as the PR19 scheme, but it is not the exact same scheme. The WRMP24 scheme includes for installation of new treatment processes. The new processes are required to mitigate water quality risks and are significantly more expensive than the elements included in the WRMP19 scope.

368. Ofwat was therefore incorrect in its assessment that the scheme is the same as that funded at PR19. We accept the original PR19 funded scheme has not been delivered as planned and to be consistent with Ofwat's approach to Rogate a non-delivery adjustment should be applied. Ofwat calculated this for Rogate by multiplying the scheme benefit by its PR24 modelled low-complexity unit cost rate which for Smock Alley would have been £2.2 million (3.1Ml/d x £0.71 million).

7.3.6. Proposed remedy

369. Ofwat has erred in disallowing any enhancement funding for the Smock Valley scheme on the basis that it overlapped with previous funding for the reasons outlined above.

370. In order to address this error, we request that the CMA redetermine our enhancement allowances to allow the difference between the funding requested in the DD Response and a calculated allowance to account for PR19 non-delivery. This is an increase in allowance of £19.1 million, which is the full cost of the revised scheme (£21.3 million) minus the adjustment for non-delivery of the different PR19 scheme of £2.2 million.

8 Remedies

8.1 The size of the enhancement errors

371. Ofwat's approach to enhancement cost assessment in the FD left a material gap between our view of costs and Ofwat's cost allowance.

372. We are asking the CMA to redetermine the most material cases where Ofwat's enhancement cost assessment errors in the FD mean that it is impossible for us – based on the allowances in the FD - to deliver what we need to do to in order to meet the statutory improvement requirements placed on us. These are summarised below.

Table 22: Enhancement cost assessment cases for which we are asking the CMA to apply remedies (Requested and allowed costs in 2022/23 prices and before Frontier Shift and Real Price Effects

	£m requested	£m allowed by Ofwat in FD.	£m gap
Weak top-down models			
Water supply interconnectors	201.9	181.7	20.2
IED	172.1	138.5	33.6
Arbitrary top-down adjustments			
Flow monitoring at sewage treatment works	69.9	48.9	21.0
Monitoring at Emergency overflows	92.8	65.0	27.9
Shallow dive	152.5	138.7	13.8
Inappropriate overlap with base			
Leakage reduction	165.8	62.8	106.8
Water Supply Works resilience transition	59.7	0	59.7
Water supply scheme: Smock Alley	21.3	0	21.3
Total	**936.0**	**635.6**	**304.3**

8.2 The remedies we ask the CMA to apply

373. We summarise below the proposed remedies that we are asking the CMA to apply on the redetermination for each of the errors identified in this Chapter. Correcting these errors as proposed will provide us with an appropriate level of enhancement funding for these material cases where Ofwat has made errors in its FD. In total the remedies we are asking the CMA to apply would increase our cost allowance by £287 million. There is a considerable cost gap between Ofwat's FD and our view of enhancement costs needed to deliver our programme. We recognise that some uncertainty will be difficult to assess at an early stage of project development. In Chapter 4: Treatment of Uncertainty Through Mechanisms, we discuss further the potential use of different mechanisms for dealing with different types of uncertainty, including cost uncertainty because of early maturity project assessments. Uncertainty mechanisms are our preferred approach to deal with some enhancements in other areas where there is a material difference between our view and Ofwat's FD view of costs.

8.2.1. Error 1 – proposed remedies:

(i) Water Supply interconnectors

374. In the FD, Ofwat determined our enhancement allowance for water supply interconnectors using econometric modelling that was inadequate for the purpose. Scheme-specific information that drives differences in costs was not reflected in Ofwat's models. Ofwat has attempted to model complex schemes but in doing so has assumed that costs are influenced by only a small number of variables, which we demonstrate above is not appropriate. The models used a limited sample of historical and forecast scheme costs to derive forecast costs and they perform poorly against statistical tests of model robustness.

375. We therefore request that the CMA redetermines our allowance for water supply interconnectors by reference to the bottom-up evidence we provided to Ofwat with our DD Response and which is appended to this Statement of Case and, in doing so, allows funding for our requested costs that are based on scheme specific scope details and market data on costs of delivery.

376. This will increase our cost allowance by £20.2 million.

(ii) Industrial Emissions Directive (IED)

377. The top-down models used by Ofwat in the FD to determine our IED allowance are weak and, for the reasons explained above the variations between companies' costs and Ofwat's benchmark are unlikely to be due to differences in efficiency.

378. We therefore request that the CMA redetermines our IED allowance by reference to the bottom-up evidence we provided to Ofwat with our DD Response, and which is appended to this Statement of Case, and accordingly allows in full our requested allowance of £172.1 million. This will increase our cost allowance by £33.6 million.

8.2.2. Error 2 – proposed remedies:

(i) Flow monitoring at sewage treatment works

379. In applying an arbitrary 30% cost reduction to our requested allowance for flow monitoring, Ofwat did not properly take into account the bottom-up costs evidence that we provided in support of our scope and costs. As a result, the allowances set out in the FD are not sufficient to enable us to deliver the flow monitoring programme which we are required to install to MCERTS standards. Ofwat did not account for our programme being atypical compared to the rest of the sector. Ofwat also did not take account of the difficulties caused by ambiguous regulatory guidance.

380. We therefore request that the CMA redetermines our allowance for flow monitoring by reference to the bottom-up evidence we provided to Ofwat with our DD Response, and which is appended to this Statement of Case, and accordingly allows in full our requested allowance of £69.9 million, increasing our allowance by £21.0 million.

(ii) Monitoring at emergency overflows

381. Ofwat has not properly taken account of detailed bottom-up evidence which supported our requested allowances to deliver our storm overflow monitoring programme.

382. We therefore request that the CMA redetermines our emergency overflow monitoring allowance by reference to the bottom-up evidence we provided to Ofwat with our DD Response which

demonstrates that the scope and cost of work we propose are efficient. This evidence is appended to this Statement of Case. We therefore request that the CMA accordingly allows in full our requested allowance of £92.8 million to address 50% of our emergency overflow sites in AMP8. This will increase our allowance by £27.9 million.

(iii) Company specific efficiency challenge

383. Ofwat amplified the errors in its enhancement benchmarking models by applying an unreliable calculation of efficiency based on poorly performing models to unrelated costs.

384. Our proposed remedy is that the company specific challenge is removed as it is not reliable. We request the CMA reviews the evidence underpinning our bottom-up costs and our requested costs where Ofwat applied its company specific efficiency challenge are allowed in full. This would increase our allowance by £13.8 million.

8.2.3. Error 3 – proposed remedies:

(i) Leakage - mains renewal for leakage reduction:

385. In order to address the errors Ofwat made in the FD, we request that the CMA redetermines our allowance for mains renewal on the following basis:

386. The application of a base replacement rate of 0.17% per year funded through the base cost allowance for asset health-related activity. This is the average implicit allowance using a number of valid alternatives to Ofwat's flawed and single approach to calculating the level of activity undertaken in the historical model input data period. Following this correction, 122 km of renewal in our programme would be considered to be funded through the base cost allowance in AMP8. However, given that our base plan envisages that only 66km will be subject to asset-health related activities alone, whereas for the residual 56km to be funded through base we will be undertaking the full scope of activities required to reduce leakage, we request the CMA to uplift the base cost allowance for these 56km by the difference between the mean unit cost for base renewals used by Ofwat (£300 per metre) and our efficient cost for our leakage reduction programme (£[redacted] per metre). Taking this approach would allow an uplift of £[redacted] million to the base cost allowance.

387. Our requested remedy is for the CMA to allow an efficient and appropriate unit cost for our region and the scope of activities in all 300km mains renewal programme which focuses on leakage reduction. Our efficient unit cost for each of these 300km is £[redacted] per metre renewal. The first remedy above covers 56km of our leakage reduction programme. This leaves 244km to be funded through enhancement to support our leakage reduction programme. Funded at our efficient cost of £[redacted] per metre means an additional £[redacted] million. This £[redacted] million should replace the FD allowance from Ofwat of £16.3 million for mains renewals relating to leakage reduction.

388. In total, the remedies we propose the CMA makes for Ofwat's errors in mains renewal result in an increased cost allowance of [redacted] made up of [redacted] base uplift and an increase from £16.3 million to £[redacted] million as enhancement allowance.

(ii) Water resilience transitional costs

[redacted]

389. The FD incorrectly disallows transitional costs in relation to investments for resilience at three WSW without proper assessment of the evidence for their need and scope. The request is not for base activities that are funded through the implicit allowance, as Ofwat wrongly considered. It is for site upgrades that are triggered by raw water quality deterioration and long-term resilience needs. An enhancement allowance for these transitional costs is appropriate as the relevant schemes constitute a phased programme of delivery for providing a step increase in treatment processes in AMP8.

390. In order to correct this, we request that the CMA redetermine our enhancement allowance to allow transition funding for AMP7 expenditure for the three WSW required as early start for delivering AMP8 resilience improvements on the basis set out in the DD Response. This will increase our allowance by £59.7 million.

(iii) Supply groundwater WRMP24 scheme

391. Ofwat has erred in disallowing enhancement funding for the Smock Valley scheme on the basis that it overlapped with previous funding for the reasons outlined above.

392. In order to address this error, we request that the CMA redetermine our enhancement allowances to allow in full the funding requested in the DD Response to deliver the scheme selected as part of the WRMP24 solution. This is an increase in our allowance of £19.1 million.

Chapter 4
Treatment of Uncertainty Through Mechanisms

Treatment of uncertainty through mechanisms

1. Executive summary

1. AMP8 involves a step change in investment, including many schemes with limited track record for delivery in the UK water sector. In many cases, new requirements were confirmed after the submission of our business plan, with further updates being provided to Ofwat throughout the course of 2024. Given the unprecedented scale of investment (for Southern Water, the PR24 enhancement programme is over five times the AMP7 allowance), with many bespoke projects being at relatively early stages of the project development lifecycle, a much greater use of uncertainty mechanisms is required than in those used the past.

2. The purpose of uncertainty mechanisms is to protect both customers and companies from material changes in circumstances, such as major changes to project scope / requirements – either through changes in the external environment, or through the company developing a better understanding of the required costs as estimates mature from early-stage projections. Where costs decrease as a result of such changes, customers should not be made to pay for the outdated scope estimates – conversely, if scope increases due to factors largely outside of company control, cost allowances need to increase so that revenues reflect the requirements the company faces. Some of the mechanisms set out in the FD meet this objective, while others require modification in order to function appropriately.

1.1. Errors

3. We identify the following errors in the FD:

- **Error 1: Designing a Delivery Mechanism that hinders delivery:** Ofwat has set a **Delivery Mechanism** for only Southern Water and Thames Water. For a pre-specified list of schemes, Ofwat will release funding only once the company has demonstrated to Ofwat's satisfaction that the company can deliver the schemes. The funding levels have been set as part of the FD – i.e., there is no scope to make the case for updated levels of funding should the need arise due to better information.

  Rather than supporting delivery of our investment programme, the delivery mechanism specified in the FD hinders delivery by creating a strong incentive for the company not to progress with the schemes in question in order to avoid a material mismatch between expenditure and funding allowances.

  The mechanism exposes Southern Water to material (up to £553 million) unremunerated downside risk, and does not give the company any ability to appeal future funding decisions made by Ofwat pursuant to a novel and as yet untested approach.

- **Error 2a:** Not **allocating uncertain schemes into the Large Scheme Gated Process:** Ofwat has established a **Large Scheme Gated Process**, whereby projects with a material level of uncertainty in their costs are required to make additional submissions during the control period, with cost allowances being adjusted for any differences to the revised agreed view of efficient costs to deliver the scoped scheme as compared to the original development allowances. Ofwat has allocated two out of five sites sat within our 'Five Site Strategy' to this process. The schemes that have not been allocated also carry a high degree of uncertainty due to their novel nature and early stages of development.

All five schemes within our programme should fall under the Large Scheme Gated Process reflecting the uncertainty present and the fact they are a single programme of works.

- **Error 2b: Preventing a suitable project from being considered within Ofwat's DPC framework:** For large standalone projects, there is a regulatory framework (**direct procurement for customers** – DPC) that enables third parties to finance, build, own, and operate the assets. For certain types of projects, this can deliver customer benefits. The DPC framework also acts as a form of uncertainty mechanism, as cost allowances are set after the third party has bid to construct the project. Basing cost allowances on these market bids helps ensure that customers pay the efficient costs of large scheme delivery. Ofwat has omitted the Bioresources project from the DPC process due to a general position of excluding these types of assets from the mechanism. However, we have identified a compelling case for their inclusion. Our Bioresources project should be included in the DPC process as doing so would give rise to at least £12 million better value for money for customers, as well as supporting the deliverability and financeability of our overall programme.
- **Error 3: Not fully defining notified items threshold:** For a specified list of areas (notified items), there is the option for revenues to be re-opened mid-period providing certain conditions are met. This includes cost increases exceeding a certain threshold. A threshold of 10% of revenues is set out in the licence. In the FD, Ofwat suggested that it may consult on lowering this threshold to ('at most') 2%. We agree that this is required. However, at the time of companies having to decide whether to accept the FD or trigger a redetermination by the CMA, this threshold change has not been confirmed, thus exposing us to an additional >£100 million risk.
- **Error 4: Failing to set an uncertainty mechanism for metering boundary box replacements:** In our business plan, we proposed an uncertainty mechanism relating to the volume of **metering boundary box replacements** that will need to be undertaken during AMP8. This was not included in the FD despite the fact that the volume required is highly uncertain, outside of company control, and has the potential to significantly impact our cost requirements. Based on data gained from other companies, the impact could be as much as £180 million.

1.2. Impacts

4. Each of the errors result in a material impact on Southern Water, as shown in the table below:

Table 1: Impacts of the errors connected to uncertainty mechanisms

Error	£m impact
Error 1: Designing a Delivery Mechanism that hinders delivery	£533m
Error 2a: Not allocating uncertain schemes into the Large Scheme Gated Process	Uncertain
Error 2b: Preventing a suitable project from being considered within Ofwat's DPC framework	£12m + other benefits
Error 3: Not fully defining notified items threshold	>£100m
Error 4: Failing to set an uncertainty mechanism for metering boundary box replacements	c.£180m

1.3. Remedies

5. We ask the CMA to:

- re-specify the delivery mechanism as a notified item, so costs can be updated based on the latest available information during the control period and for the assessment to be subject to the standard appeals process if required;
- allocate the entire of our 'Five Site Strategy' programme to the large scheme gated process, so that cost allowances can be adjusted up or down during the control period as improved information becomes available;
- allocate the Bioresources project to the DPC process to realise benefits to customers;
- reduce the notified item materiality threshold to (at most) 2% (as per Ofwat's stated, but as yet undelivered policy position); and
- specify the uncertainty associated with meter boundary box replacement as a notified item.

2. Introduction

6. **An approach to uncertainty mechanisms is required that supports the delivery of the biggest capital programme Southern Water has ever had. Aspects of the approach set out in the FD hinders, rather than helps our delivery of our planned investment programme.**

7. We require some targeted changes to the uncertainty mechanism framework in order to create an appropriate balance of risk between the company and customers, and to avoid perverse economic incentives, which run counter to Southern Water's duty to deliver its statutory outputs and, as such, achievement of the government's objectives.

2.1. Key context

8. AMP8 will involve a step change in the level of investment for the sector. Totex allowances for Southern Water are to increase by over 100% (in real terms) compared to the previous control period allowances (and are still not sufficient given the new statutory requirements the company now faces – *see Chapter 2 (Base costs) and Chapter 3 (Enhancement Expenditure Allowances).*

9. The vast majority of this increase is driven by new environmental requirements prompting higher enhancement expenditure. In many cases, the enhancement programme includes schemes with limited track record for delivery in the UK water sector. In many cases, new requirements were confirmed after the submission of our business plan, with further updates being provided to Ofwat throughout the course of 2024 (the EA issued the WINEP in July 2024).

10. Given the unprecedented scale of investment (**for Southern Water, the PR24 enhancement programme is over five times the AMP7 allowance**), with many bespoke projects being at relatively early stages of the project development lifecycle, **a much greater use of uncertainty mechanisms is required** than those used in the past.

11. The purpose of uncertainty mechanisms is to protect both customers and companies from material changes in circumstances, such as major changes to project scope or requirements. These changes could come about because of changes in the external environment, or through Southern Water developing a better understanding of the required costs as estimates mature from early-stage projections. Where costs decrease as a result of such changes, customers should not be made to pay for the outdated estimates. Conversely, if the estimate increases due to factors largely

outside of our control, cost allowances need to increase so that allowed revenues reflect the requirements we face. Some of the mechanisms set out in the FD meet this objective, while others require modification in order to function appropriately.

12. Ofwat's FD includes the following mechanisms:

- **Delivery Mechanism** – this applies only to Southern Water and Thames Water. For a pre-specified list of schemes, Ofwat will release funding only once the company has demonstrated to Ofwat's satisfaction that the company can deliver the schemes. The funding levels have been set as part of the FD – i.e., there is no scope to make the case for updated levels of funding should the need arise due to a change in circumstance outside of our control or further clarity on the costs required to deliver the scheme becoming available.
- **Large scheme gated process** – Ofwat has provided initial development funding for large schemes with high levels of optioneering, scope and cost uncertainty, or novel technologies. Companies are required to make two submissions to Ofwat at different stages of the project development. Following the second submission, allowed revenues will be logged-up based on any differences to the revised view of efficient costs to deliver the scoped scheme as compared to the original development allowances. Logging-up will be by way of an adjustment to the RCV at the end of the period as default. Anything beyond this would be subject to 25:25 cost sharing. Ofwat is proposing no time value for money adjustment for logging-up (with the result that we will bear the funding cost during AMP8), and will consider in-period revenue changes only if companies can provide evidence that revenue is required for financeability, on a notional company basis.
- **Enhanced engagement** – specified schemes are subject to a different cost sharing rate (25:25), and require companies to make a quarterly submission to Ofwat including evidence of the activities (such as feasibility, scoping, design and costing) as expected for the formal gated process.
- **Storm overflows uncertainty mechanism** – this will provide additional funding for companies through the PR24 reconciliation at PR29, insofar as companies have delivered additional storm overflow schemes and storage during AMP8 and provided that:
  - the additional schemes and storage are driven by new requirements under the Urban Wastewater Treatment Regulations (UWWTR), newly designated bathing waters, or due to revision of the Storm Overflows Discharge Reduction Plan (SODRP); and
  - it is not possible to swap out existing schemes.

  The uncertainty mechanism will apply solely to grey/hybrid[1] scheme allowances.
- **Notified items** – for a specified list of areas, there is the option for revenues to be re-opened mid-period providing certain conditions are met. This includes cost increases exceeding a certain threshold. A threshold of 10% of revenues is set out in the licence. In the FD, Ofwat suggested that it may consult on lowering this threshold to ('at most') 2%. However, at the time when we had to decide whether to accept the FD or trigger a redetermination by the CMA, this threshold had not been confirmed. At the time of writing, it remains unconfirmed.
- **Direct procurement for customers (DPC)** – for large standalone projects, there is a regulatory framework (DPC) that enables third parties to finance, build, own, and operate the assets. For certain types of projects, this can deliver customer benefits. The DPC framework also acts as a form of uncertainty mechanism, as cost allowances are set after the third party has bid to construct the project. Basing cost allowances on these market bids helps ensure that customers pay the efficient costs of large scheme delivery. We have an additional scheme that we consider should be included in the DPC process as there would be clear benefits to customers of doing so.

[1] 'Grey' storage largely comprises conventional storage solutions such as tanks or pipes. 'Green' solutions comprise a range of sustainable drainage solutions such as swales, ponds, rain gardens, or permeable paving.

13. With respect to these six mechanisms, we confirm that we are not seeking a redetermination by the CMA in respect of either (i) the enhanced engagement mechanism or (ii) the storm overflows uncertainty mechanism.

14. Errors relating to the remaining mechanisms, and our request of the CMA for a redetermination with respect to the same, are set out below.

2.2. Error summary

15. There are four errors in the FD relating to the specification of uncertainty mechanisms:

1) **Incorrect specification of the delivery mechanism** – rather than supporting delivery of our investment programme, the delivery mechanism specified in the FD hinders delivery by creating a strong incentive for the company not to progress with the schemes in question in order to avoid a material mismatch between expenditure and funding allowances. The mechanism exposes Southern Water to material unremunerated downside risk, and does not give the company any ability to appeal future funding decisions made by Ofwat pursuant to a novel and as yet untested approach.

2) **Schemes not included in the relevant mechanism** – the FD applies the large scheme gated process to only two of our five resilience schemes despite all schemes falling within the same programme of work and having similar levels of uncertainty.

Separately, Ofwat's approach to determining eligibility for schemes to be considered for treatment under the DPC framework, together with its decision not to take forward proposals for alternative forms of market-based delivery, led it to reject a Southern Water scheme for such treatment, despite evidence that it is beneficial for customers for the scheme to be included within this mechanism.

3) **Undefined parameters** – the FD is not complete regarding the treatment of notified items. Clarity on how these will operate is essential for the company to understand its risk exposure.

4) **Omission of a required mechanism** – in our business plan, we proposed an uncertainty mechanism relating to the volume of metering boundary box replacements that will need to be undertaken during AMP8. This was not included in the FD despite the fact that the volume required is highly uncertain, outside of company control, and has the potential to significantly impact our cost requirements.

16. A detailed explanation of each of these errors is provided in the subsequent sections.

3. Error 1 – incorrect specification of the delivery mechanism

3.1. Approach to the delivery mechanism

17. We highlighted in our October 2023 business plan that there were major uncertainties in parts of our capital programme.[2] We proposed the use of 'notified items' to facilitate changes to allowed revenue to reflect material changes relating to our statutory programmes.

18. Notified items form part of an established 'interim determination' mechanism embedded within our price control licence condition that enables Ofwat to adjust allowed revenues within the five-year control period either up or down as new information arises. By identifying a programme or scheme as a notified item for the purposes of the FD, Ofwat triggers the availability of the interim determination mechanism with respect to that programme or scheme. Notified items can therefore be used to manage allowances in respect of programmes or schemes the cost of which is uncertain at the point when Ofwat makes its FD.

19. Following the submission of the business plan, it became apparent that there would continue to be major changes to our statutory programmes following further requirements / guidance from environmental regulators.

20. We met with Ofwat to discuss appropriate uncertainty mechanism(s) that might be introduced to accommodate late changes to programmes resulting in uncertainty of AMP8 expenditure. Following discussions with Ofwat, we submitted in May 2024 a proposal for how a 'Delayed Allowance Mechanism' could work.[3]

21. In the DD, Ofwat set out proposals for the delivery mechanism (**DM**). However, these proposals contained limited details on how the DM would operate. It was not clear in the DD whether the DM allowed for future funding allowances to be adjusted to reflect the latest information as greater clarity of requirements emerged. For example, the following statements from Ofwat suggested that additional funding would be available:

> *"We propose to include expenditure in a delivery mechanism. This will allow companies to access additional funding when they are able to deliver these schemes."*[4]
>
> *"In each of years two, three and four of the 2025-26 to 2029-30 period, each company would set out annually in advance (as part of the delivery plan progress report) the individual schemes in the delivery mechanism it considers it could deliver in the subsequent year (together with evidence for that assessment) and would request funding for those schemes ("the Funding Request").*
>
> *If Ofwat has confidence that the company could deliver those schemes, its bill profile would be adjusted to include the RCV run-off and WACC return arising from those schemes (together with regulatory confirmation of the associated RCV)."*[5]

22. In its response to the DD, we welcomed the principle of having a mechanism that would allow for mid-period changes to revenues for more uncertain schemes. We provided proposals on how the DM could work in practice, specifically stating the need for the funding request to be based on up-

[2] Southern Water, October 2023, SRN58 Uncertainty Mechanisms Technical Annex, SOC-4-0001.
[3] Southern Water, Delayed Allowance Mechanism DRAFT proposal to Ofwat – FOR DISCUSSION, SOC-4-0002.
[4] Ofwat, July 2024, PR24 draft determinations: Expenditure allowances, page 184, SOC-4-0003.
[5] Ofwat, July 2024, PR24 draft determinations: Expenditure allowances, page 186, SOC-4-0003.

to-date information and costings at the time of submission, and for there to be the ability to appeal any decision Ofwat makes.

23. Following the submission of the DD response, we met with Ofwat (CEO to CEO, and Director of Strategy & Regulation to Senior Director of the Price Review). These were followed up in writing making clear the importance of future flexibility in setting cost allowances to take on board information that becomes available at a later date.[6]

24. However, in the FD, Ofwat set out a position that does not allow for cost allowances for schemes contained within the DM to be revisited at a later date. Cost allowances have been set upfront as part of the price review. The DM operates solely to release the funding for these pre-set allowances following Ofwat's assessment of the schemes' deliverability – i.e., absent Ofwat's approval, the price review allowances will not be released for schemes within the DM. This is not in accordance with the proposals that we made throughout the price review process, and the subsequent discussions with Ofwat's senior team.

25. In addition, the FD does not provide for any route for Southern Water to appeal Ofwat decisions under the DM. Ofwat stated:

> *"We also do not consider that the introduction of a specific appeal mechanism for in-period determinations (which would require a licence modification) is necessary or proportionate because of the relative (sic) small size of the schemes and the focus on delivery. Southern Water will have the same opportunity as other companies to ask for a redetermination by the CMA if it disagrees with the expenditure allowances we have set as part of our final determinations."*[7]

26. We do not agree that the introduction of an appeal mechanism for the DM is disproportionate or not required. An appeal to the CMA is available for the existing interim determination (notified item) mechanism contained within our price control licence condition. An appeal mechanism is appropriate in circumstances where, as with the DM, Ofwat will be making decisions with respect to allowances that are equivalent to those made in the context of an interim determination pursuant to a notified item.

27. The DM would not require a licence modification if – rather than a bespoke mechanism – it was treated like a notified item.

28. In conclusion, the DM set out in the FD fails to address the concerns we had identified in our engagement with Ofwat. The purpose of an uncertainty mechanism is to allow for revenues to change (up or down) should circumstances change. **The DM acts as a potential downside-only mechanism, providing Ofwat with discretion not to provide funding for schemes that Southern Water has statutory obligations to deliver**.

3.2. Errors with the delivery mechanism specification

29. The specification of the DM in the FD gives rise to the range of issues set out below:

i) Costs will not be updated to reflect latest information

30. Given the early stage of development of a number of schemes within the DM and the overall delivery challenges of AMP8, Southern Water and its customers would both benefit from an

[6] Southern Water, November 2024, Email - Subject: "Meeting note - 31_10_2034 - Delivery Mechanism", SOC-4-0005.
[7] Ofwat, February 2025, PR24 Final Determinations Expenditure allowances, page 334, SOC-1-0006.

uncertainty mechanism that adjusts the levels of funding allowances to reflect material changes in project costs as scheme maturity develops. The DM does not do this.

31. The schemes subject to the DM are summarised below.

Table 2: Schemes subject to the DM

	Scheme description
Continuous River water quality monitoring (100% of the programme)	This is a new requirement for AMP8. We are looking to install new monitors on our wastewater assets. The scale of the solution required is still not fully known as we do not yet fully understand the costs of acquiring this land and providing power to these sites. Each site will require installations within the river and on adjacent land with unique access requirements for each. These sites are generally relatively remote, i.e., some way from land / assets we already own.
P Removal (45% of the programme)	Phosphorus Removal has been included in the DM because the scale of the programme is so large. AMP8 requirements are tighter than we have seen in AMP7. More sites are required to achieve 0.5 parts per million (ppm), 0.25ppm or Technically Achievable Limits (TAL) than we have seen in prior AMPs.
N Removal (33% of the programme)	Nitrogen Removal has been included in the DM because the scale of the programme is so large. AMP8 requirements are tighter than we have seen in AMP7. More sites are required to achieve 0.5ppm, 0.25ppm or TAL than we have seen in prior AMPs.
Storm Overflows (26% of the programme)	Storm Overflows have been included in the DM because of uncertainty around the scale and solutions across our programme. For example, the Portsmouth Harbour area has been included where our final option is still being determined.

32. It is clear that there are material uncertainties on the future scope and/or costs of these schemes. Indeed, if all vital aspects of their delivery were currently known, then Ofwat would not have included the schemes in a delivery mechanism.

33. By specifying the DM as it has in the FD, Ofwat will not be making best use of future information when it undertakes its mid-period assessment, which will be limited solely to considerations of deliverability. As Ofwat has set the cost allowances upfront in the FD, it is possible that when Ofwat determines the deliverability, the release of the allowed costs could be materially under or over the true cost requirements.

34. **There is no good reason why Ofwat cannot consider the latest information on scope and/or costs mid period, and take an updated view of the efficient cost allowance at that stage**. Elsewhere in the FD, Ofwat has included provisions to undertake mid-period reviews of costs for schemes, in many cases that are lower in materiality than the schemes set out in the DM. For example, the notified item process allows for costs to be revisited mid period. For PR24, Ofwat is proposing a notified item materiality threshold of ('at most') 2% of revenues. For Southern Water, this would be c.£25 million – a fraction of the scheme value included in the DM.

35. This is not just an issue of protecting Southern Water from the cost of emergent scope**. Customers may benefit from regulatory scrutiny** of more than £500 million of expenditure when there is greater clarity on the scope of the project and more refined cost estimates are available.

ii) Perverse incentives

36. Rather than supporting the delivery of the investment programme, as specified in the FD, the mechanism hinders delivery. This is because **the company is incentivised not to incur any costs in developing projects that Ofwat (through its subjective assessment) may deem to be undeliverable.**

37. Southern Water has statutory obligations to deliver the schemes subject to the DM. As such, it should be seeking to do all it can to make sure that these are delivered. **A failure by Ofwat to provide the funding required for statutory outputs does not support their delivery and would leave the company with a material mismatch between its allowances and obligations.**

38. The table below summarises the statutory obligations that underpin the needs for the schemes set out in the DM.

Table 3: Statutory obligations associated with the schemes in the DM

Scheme	£m	Statutory obligation
Continuous river water quality monitoring	40	A new requirement in the Environment Act 2021 is a provision for water companies to monitor river water quality upstream and downstream of assets that discharge to a watercourse. The EA has issued WINEP guidance for these requirements for implementation in PR24.[8] Following the phasing steer provided by the Secretary of State in July 2023, provision of continuous monitoring will be undertaken by 2030 at an initial 25% of all sites, focusing on high priority locations.
Phosphorus removal	171	All of the AMP8 investments are enhancements to meet tighter permit levels set in the WINEP.[9]
Nitrogen removal	78	
Storm overflows	264	Our storm overflows programme is focused on the main Defra target to improve overflow discharging into bathing waters and other high priority sites, including shellfish waters. The key date for this target is 2035 (end of AMP9).[10]
Total	**553**	

39. In addition, Ofwat has applied the DM (a downside-only mechanism) to Southern Water and Thames Water following their presentation of an open and honest assessment of their deliverability concerns in their business plans. In future, other companies may be disincentivised to reveal pertinent challenges to the regulator for fear of such a mechanism being applied to them. This runs counter to well established regulatory frameworks, under which regulated companies are encouraged to reveal information. Instead, it penalises honesty and transparency.

[8] For further details, see: Southern Water, October 2023, SRN41 Wastewater WINEP Monitoring Enhancement Business Case, SOC-3-0022.
[9] For further details, see Southern Water, October 2023, SRN39 WINEP Enhancing Wastewater Treatment Enhancement Business Case, SOC-4-0006.
[10] For further details, see Southern Water, October 2023, SRN40 WINEP – Storm Overflows Enhancement Business Case, SOC-4-0007.

40. The DM does not provide any additional benefits relative to other parts of the regulatory framework. Should either Southern Water or Thames Water underdeliver, the PCDs should claw back the non-delivered cost allowance and the DDCM should remove the time value of money thereby providing the same customer protections as the DM. The DM simply adds in more bureaucracy, complexity, and risk to the process.

iii) Restrictive design

41. The DM as specified in the price control notice, explicitly states that Ofwat can only release funding if the schemes are deliverable by 1 April 2030 "*or by no later than 3 months after that date*".[11] This means that even if the Environment Agency and Southern Water agree (for good reasons) a scheme delay of, for example, 4 months post 1 April 2030, Ofwat has no discretion or ability to release funding for that project.

42. This restrictive design would mean that **the company would be penalised even if it were delivering in line with the timelines agreed with its quality regulators**.

iv) Major driver of asymmetric risk

43. The DM introduces a new and material risk into the price control framework. If we do not demonstrate to Ofwat's satisfaction that we can deliver the schemes in question, the funding will not be provided.

44. **The DM places up to £553 million of our cost allowances at risk – equivalent to a single-year RoRE impact of c.2.4%.[12] This is nearly half of our entire allowed return on equity at risk based on a single subjective and untested mechanism.**

45. This creates a major risk to Southern Water that is not reflected in allowed returns; we have been set the same allowed return as the rest of the sector, but it is only Thames Water and Southern Water that are subject to the DM.

v) No ability to appeal

46. Limited details have been provided as to what evidence needs to be provided to demonstrate that the scheme in question can be delivered such that funding will be released. **This is a new mechanism with no precedent for how Ofwat might approach the analysis**.

47. Ofwat set out four areas where we must receive confirmation from an independent third-party assurer to inform Ofwat's assessment of the funding request. These are shown below:[13]

[11] Ofwat, December 2024, Notification of the PR24 final determination of price controls for Southern Water Services Limited, page 23-24, SOC-4-0008.
[12] The full £553 million impact would be substantially higher if assessed in a single year. To calculate the single-year RoRE impact on return on regulated equity, we have assessed the impact in 2028/29 based on overspend post cost sharing. The full cash flow impact would be borne by the company until PR29.
[13] Ofwat, February 2025, PR24 Final Determinations Expenditure allowances, page 336, SOC-1-0006.

Table 4: Independent assurer requirements

Confirmation from the independent third-party assurer that:	Our position on the clarity of the requirements
The start date and target completion date of the scheme included in the delivery progress report are correct	• It is not clear what steps the independent assurer is expected to undertake in order to confirm the dates are 'correct'. While this could involve simply reviewing the dates align to our plans, a different interpretation could be that the assurer needs to review all critical path activities within the plan, and then form their own view on the appropriate length of time for different activities – i.e., to form a view on whether the completion date is achievable.
The company has a plan in place to deliver the scheme	• It is unclear what level of detail or type of plan is required in order meet this requirement, or whether there are any expectations as to what the plan should include.
The company has appropriately identified all the delivery risks for the scheme and has put in place actions to mitigate these risks	• It is not clear how comprehensive a list of 'all delivery risks' would need to be. For example, should the list include extremely low likelihood events, such as a pandemic? • It is not clear how comprehensive the mitigation plan needs to be. In some cases, risks (such as rejection of planning permission) will result in target dates having to be rescheduled. For example, would a mitigation that results in a movement of the target date be seen as an acceptable mitigation?
The target completion date of the scheme is deliverable by the end of the 2025-30 period or no more than 3 months after the end of this period	• It is not clear what information should be assessed and what analysis should be undertaken by assurer to inform their judgement on deliverability.

48. The above confirmations all rely on an independent assurer making a series of judgements on requirements that are new and lack any established precedent. We (like other water companies) have not yet appointed a third-party assurer, let alone begun discussions on how they might approach such an assessment. Further, it is not clear whether Ofwat only requires independent assurance, or whether Ofwat may form its view based on additional information and/or analysis. There is no clear process, and no established precedent that can be considered.

49. This is a new regulatory process. There is no precedent regarding how Ofwat might reach a determination of whether or not it considers that schemes are deliverable.

50. Under the DM mechanism set out in the FD, there is no scope for the company to appeal any Ofwat determination made under the DM. If we disagree with Ofwat's within period position for the DM, we have no regulatory or legal protections.[14]

[14] Short of judicial review, which has a high threshold for successful challenge.

51. This is in stark contrast to the position under the existing interim determination regime. In that case, where Ofwat makes a determination pursuant to a notified case, the company may request that that the determination is referred to the CMA for redetermination.

52. This issue was raised to Ofwat as part of the draft determination representations. In the FD, Ofwat stated:

> *"We also do not consider that the introduction of a specific appeal mechanism for in-period determinations (which would require a licence modification) is necessary or proportionate because of the relative (sic) small size of the schemes and the focus on delivery. Southern Water will have the same opportunity as other companies to ask for a redetermination by the CMA if it disagrees with the expenditure allowances we have set as part of our final determinations."*[15]

53. We do not agree that the introduction of an appeal mechanism for the DM is disproportionate or not required. The schemes included within the DM are not of a relatively small size. Ofwat has allocated £553 million of our schemes to the DM. This is c.12% of our total enhancement cost allowance which is clearly significant.

54. Not having the ability to appeal the application of a novel, and as-yet untested, mechanism that affects a major part of the company's cost allowance introduces a major risk (equivalent to a single-year RoRE impact of c.2.4%) for Southern Water that is not reflected in allowed returns. We have been set the same allowed return as the rest of the sector, but it is only Thames Water and Southern Water that are subject to the DM.

55. The DM would not require a licence modification if – rather than a bespoke mechanism – it was treated like a notified item.

Summary

56. Ofwat has applied a restrictive downside-only mechanism to only two companies (of which Southern Water is one). The mechanism provides a **clear disincentive for timely delivery, and risks the company not being funded to deliver key statutory outputs**.

57. The mechanism **does not protect customers** from the risk of the current scope being overstated, and **does not protect the company** from future (legitimate) cost increases as greater clarity on scope is developed.

58. The **size of the risk is highly material**, with up to £553 million of funding being at risk from an **unclear mechanism that has no precedent on its application, and no mechanism for appeal** should we disagree with Ofwat's assessment of deliverability.

59. This **risk has not been reflected in the allowed returns** – we have been set the same allowed return as the rest of the sector despite being made subject to this bespoke, novel, and highly material mechanism.

[15] Ofwat, February 2025, PR24 Final Determinations Expenditure allowances, page 334, SOC-1-0006.

4. Error 2 – schemes not included in the relevant mechanism

4.1. Approach to scheme allocations

4.1.1. Large scheme gated process

60. We proposed a major water supply resilience programme, known as the 'five sites strategy'.

61. [redacted] and Weir Wood (1955) are our largest, and most strategically important Water Supply Works (**WSW**) currently in operation. These WSWs are responsible for providing safe drinking water to over 720,000 properties daily and are a core component of our long-term strategy for water supply until at least 2050.

62. The proposed investment covers everything from renewing ageing control systems, to installing additional treatment processes to cover changing raw water requirements and improving the handling of waste.

63. All five schemes are linked. In the case of [redacted] and Weir Wood, this linkage is direct as the works both feed into North Sussex. At non hydraulically linked sites, the linkage is through the ability to provide emergency response contingency to ensure that customers are protected when work is planned for our water treatment and network assets. This is called the Safe Control of Operations (**SCOs**).

64. There are restrictions on what work can be carried out concurrently across our asset base. Due to the criticality of our largest supply sites we do not permit concurrent shutdowns on any of our largest sites. Therefore, work must be managed and scheduled across these sites to ensure there are no clashes. This also means that during significant supply interruptions anywhere in our network, SCOs will not be granted for any of our major supply works.

65. Over the last ten years, the DWI has served Notices at each of the five sites[16]. Working closely with the DWI, we reviewed the Notice commitments for the five sites and proposed new delivery dates and solutions that would deliver the long-term site strategies and produce the best outcome for customers.

66. While a number of the deliverables in the Final Enforcement Orders (**FEOs**) are itemised, and were specifically included in the PR24 submission, others were actions that require submission of an investigative report, the outcome of which becomes enforceable under the FEO.[17] The cost of delivering these additional scope items can only be fully assessed once the scope items are known.

67. In 2022, the DWI issued a notice to build a new plant at Weir Wood as a long-term solution due to the identification of a number of issues, which presented an unacceptable risk to water quality to our customers. The Weir Wood notice was recently updated[18] to reflect the multi-phase delivery required at Weir Wood to meet WRMP commitments. We have since received FEOs from the DWI in February 2023 at [redacted]

[16] Notices under Regulation 28 of the Water Supply (Water Quality) Regulations 2016 mandate measures to mitigate risks.
[17] FEOs are issued when a company has failed to undertake the steps identified in the notices.
[18] Southern Water Services Limited, Weir Wood Multi Phase - Notice under regulation 28(4) of the Water Supply (Water Quality) Regulations 2016 (as amended), SOC-4-0009.

68. While the need to invest in these sites is clear, material uncertainty remains as to what specific solutions are required in order to ensure compliance with the FEOs.

69. This has resulted in a significant evolution of cost estimates during the course of the price review process. The below table shows how enhancement cost estimates changed from the business plan through to the DD response.

Table 5: BP to DD changes in costs for the five sites

Site	Site Ref	Business plan, £m	DD response, £m	Change
[redacted]	WTW1	120.2	101.5	-16%
[redacted]	WTW2	111.2	105.7	-5%
[redacted]	WTW3	29.3	27.7	-5%
[redacted]	WTW4	43.4	47.2	+9%
Weir Wood	WTW5	-	74.3	New site

70. As can be seen from this table, the cost estimates have changed by material amounts in less than a year, and will continue to fluctuate until the full scope of each project is confirmed.

71. In the DD, Ofwat allocated two of the schemes to the large scheme gated process ([redacted]).

72. In response to the DD,[19] we proposed that all five sites should be subject to the same uncertainty mechanism, as they are all part of the same programme of works. We proposed an enhanced engagement cost sharing mechanism (**EECS**), which would apply enhanced cost sharing rates for schemes for which there is material uncertainty around scope.

73. We also provided details of the Weir Wood site. This was not included in the October 2023 business plan, due to revaluation of the risks associated with the bacillus growth and to identify a suitable solution that was most cost effective for improving water quality and improving value for customers. This evaluation was critical as we need to deliver a solution that forms part of the best value, long term supply solution for this zone.

74. In the FD, Ofwat kept [redacted] and [redacted] in the large scheme gated process but did not apply any form of uncertainty mechanism for the other three schemes.[20]

4.1.2. Direct procurement for customers

75. Direct Procurement for Customers (**DPC**) involves a water or wastewater company putting responsibility for delivering a large infrastructure project out to competitive tender, resulting in the selection of a third-party Competitively Appointed Provider (**CAP**). The CAP may typically Design, Build, Finance, Operate and Maintain (**DBFOM**) the new large and discrete infrastructure.

[19] Southern Water, August 2024, SRN-DDR-027: Supply Resilience Enhancement Programme Enhancement Cost Evidence Case, SOC-4-0010.
[20] We discuss the error Ofwat made in disallowing transition funding (i.e., spend in AMP7 as early start on AMP8 deliverables) for the water resilience schemes in our enhancement grounds (see Chapter 3 (Enhancement Expenditure Allowance)).

76. Appointees are required to use DPC by default for the delivery of all discrete projects with whole life total expenditure (totex) in excess of £200 million.[21] Ofwat reserves the right to explore the use of DPC for major projects below this £200 million threshold, where it may offer value for money (**VfM**) for customers to do so.

77. Discreteness assesses how a project's characteristics affects its suitability for DPC, on the basis that projects that are separate from a company's existing operations are better suited for third-party CAP delivery.

78. Water companies and the CAP enter into a contract, known as the CAP Agreement (**CAPA**), for a fixed term, which includes construction and approximately 25 years of operation. For the duration of the CAPA, the company recovers payments due to the CAP through an Allowed Revenue Direction (**ARD**) and a related licence condition, which gives rise to a revenue stream that is separate and distinct from the company's existing price control.

79. Ofwat's additional technical discreteness guidance[22] and its implications for the DPC eligibility of projects excludes several small assets and those whose asset lives are less than the typical length of a DPC contract (c.25 years).

80. As a consequence, we proposed an alternative model[23] (previously termed 'DPC-lite'[24]) for delivery of five major projects that were not eligible for DPC delivery. We considered that this alternative market-based delivery (**MBD**) model would benefit us and our customers in terms of both deliverability and financeability, and that reallocation of some or all of these projects to an alternative MBD route would have been expected to lessen that burden (see the chapter on risk, return and financeability for further details on our financial position).

81. The alternative MBD model we proposed is analogous to DPC, in so far as we proposed a mechanism similar to the ARD provided by Ofwat for DPC projects that would establish a separate and distinct revenue stream from customers that would align with the company's contractual obligation to make payments to the third party selected to deliver the project.

82. Our Business Plan for PR24 identified four projects which we considered to meet the criteria set by Ofwat for DPC delivery, and an additional five projects that were proposed to be delivered by the alternative MBD route.

83. In the DD, Ofwat approved the use of the DPC route for two projects (albeit on the basis that they would be consolidated into a single DPC project), the other two being designated for in-house delivery. In relation to the projects for which alternative MBD was proposed, Ofwat indicated that it was open to considering forms of alternative MBD route.

84. In our response to the DD, we updated our project delivery route proposals such that alternative MBD was proposed for the following projects:

- Sittingbourne industrial re-use
- Smart metering
- Bioresources
- Local authority highway SuDS
- Whitfield WTW

85. The table below presents the progress of projects through the regulatory process up to the FD.

[21] For PR19, water companies were required to consider the use of DPC for discrete, large-scale enhancement projects expected to exceed £100 million in whole life totex.
[22] Ofwat, July 2023, Technical Discreteness Guidance, SOC-4-0004.
[23] Southern Water, August 2024, SRN-DDR-039: MarketBased Delivery, page 11, SOC-4-0011.
[24] Southern Water, October 2023, SRN17 Direct Procurement for Customers and Alternative Delivery Model Technical Annex, SOC-4-0012.

Table 6: Summary of Ofwat DD and FD DPC decisions

Project	Ofwat decision at DD	Our proposed delivery route	Ofwat position at FD
Aylesford and Ford	DPC	DPC	DPC
Sandown	In-house, Large scheme gated process	In-house, propose moving from large scheme gated process to enhanced engagement and cost sharing mechanism	In-house, Large scheme gated process
Sittingbourne	In-house, large scheme gated process	Large scheme gated process, progress market-based delivery	In-house, Large scheme gated process
Smart metering	In-house	Market-based delivery and engagement with Ofwat	In-house
Bioresources	In-house	Progress market-based delivery	In-house
SuDS	In-house	Progress market-based delivery in collaboration with local authorities	In-house
Whitfield	Ofwat error – missing in DD	Inclusion in large scheme gated process, progress market-based delivery	In-house, Large scheme gated process
Wetlands	In-house	In-house, part of storm overflows which we propose to be included in the enhanced engagement and cost sharing mechanism and the delivery mechanism	In-house
HWTWRP	DPC, SRO	Continue as SRO	DPC
T2ST	DPC, SRO	Continue as SRO	DPC
SESRO	DPC, SRO	Continue as SRO	DPC

86. As shown in the above table, Ofwat declined to apply alternative MBD to any of the five projects we had proposed for that purpose. The FD instead requires that those projects be delivered in-house. In the case of Sittingbourne and Whitfield, in-house delivery will utilise the large scheme gated process.

87. The FD formally left open the possibility of alternative MBD being available for specific projects at least in principle, although without indicating which projects might ultimately progress through this route. Ofwat stated that the existing regulatory framework allows us to deliver these schemes without further regulatory adaptations.[25]

[25] Ofwat, February 2025, PR24 final determinations: Major projects development and delivery, page 13, SOC-4-0013.

4.2. Errors with the scheme allocations

4.2.1. Large scheme gated process

88. Three water resilience schemes ([redacted] and Weir Wood) have the same project characteristics as other projects that were allocated to the large scheme gated process. However, these three schemes do not benefit from any uncertainty mechanism under the FD.

89. These schemes have a material degree of uncertainty and are progressing through a series of project gateways (in line with schemes subject to the large scheme gated process). It would be in the interests of customers and Southern Water for the costs for these three water resilience schemes to be subject to review by Ofwat at a later stage of development.

90. Weir Wood is a multi-phase delivery and rebuild of a new site. A proposal for this scheme has been presented to and accepted by the DWI, as shown in its latest notice.[26] It should qualify for a gated delivery in line with the timeframes agreed with DWI.

91. We are seeing significant increases in scope at [redacted] and Weir Wood as we move into detailed site-based design work. This includes additional enabling works to facilitate construction and commissioning.

92. The latest best estimate of costs at [redacted] is now £127 million, or a c.170% increase to date from the DD Response figures. The scale of this potential change serves to illustrate the uncertain nature of the project's scope. The project is still at an early stage of development, and so further cost changes are highly likely.

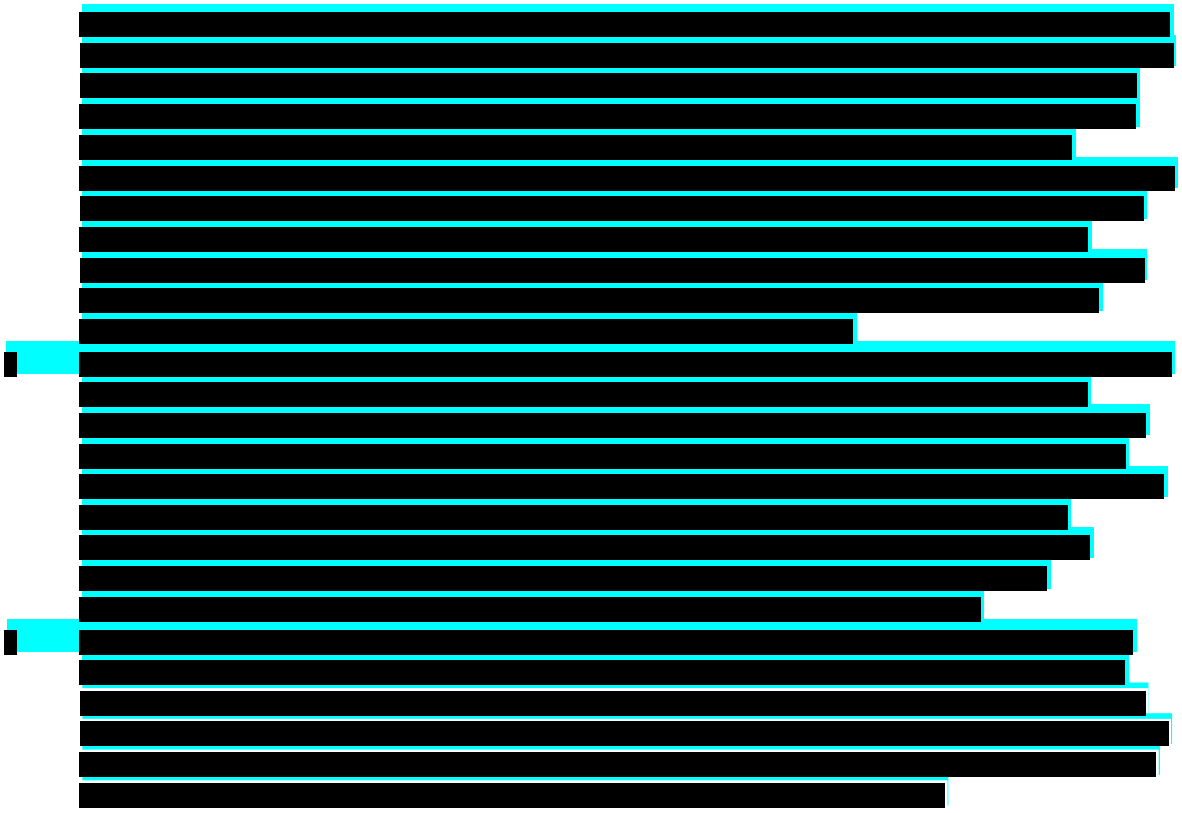
93. Examples of recent scope changes which are resulting in cost changes for the schemes include the following:

[redacted]

94. There is also major cost uncertainty at [redacted] for example:

- [redacted]

[26] Southern Water Services Limited, Weir Wood Multi Phase - Notice under regulation 28(4) of the Water Supply (Water Quality) Regulations 2016 (as amended), SOC-4-0009[redacted]



95. The above uncertainties serve to illustrate the changing nature of the cost estimate as schemes progress .

96. **The FD is wrong insofar as it applies different regulatory approaches to schemes within a single programme of works, and omits three of the sites from a mechanism that would recognise the uncertainty of the scope given the early stage of project development.**

4.2.2. Direct Procurement for Customers – Bioresources project

97. The Ham Hill and Ashford Bioresources projects (referred to collectively as the **Bioresources project**) were not allocated to the alternative MBD route nor considered for DPC, despite the potential VfM benefits and market interest in competitive delivery of these projects. We consider that Ofwat's decision not to select this Bioresources project for competitive delivery is inconsistent with its duty (and that of the CMA) to protect the interests of consumers wherever appropriate by promoting competition.

98. The Bioresources project was not considered for DPC, due to Ofwat's DPC guidance excluding that asset type. [27]

99. Funding for the Bioresources project capex was allocated under base expenditure in the FD.[28] However, the project meets the DPC eligibility criteria, i.e. whole-life totex is above £200 million and the infrastructure project is discrete.[29] Furthermore, in our view, delivering bioresources via

[27] Ofwat, April 2023, Direct Procurement for Customers - Technical discreteness guidance, page 3, SOC-4-0031.
[28] See Chapter 2 (Base Costs) for further details.
[29] Southern Water, October 2023, SRN17 Direct Procurement for Customers and Alternative Delivery Model Technical Annex, page 104, SOC-4-0012.

DPC would be in accordance with Ofwat's objective of promoting competition in the bioresources market

100. In its consultation dated May 2021 for the review of bioresources market[30], Ofwat noted that DPC would not generally apply to bioresources activities due to their nature and scale. Ofwat identified several issues during their review of water companies' business plans for PR19. One key concern was the lack of detailed information on how companies planned to engage with third parties. Ofwat further highlighted issues based on their observations from their assessment of water companies' business plans at PR19, such as the level of detail on approaches to third-party engagement being limited.

Market consultations and value for money

101. We conducted extensive market consultations[31] regarding our Bioresources project which gained a positive sentiment from the market. The participants were interested in DBFOM for our Ham Hill and Ashford Bioresources project. Participants expressed positive sentiment towards the project, noting that the overall scope of the project aligns with their areas of interest and expertise.

102. In addition, we conducted a VfM assessment, combining qualitative and quantitative factors based on a specified methodology for combining both assessments.[32] These assessments are on the basis that the projects will be tendered under the late tender model. Under this model, the third party will be responsible for DBFOM of the project.

103. Based on the qualitative VfM analysis, the majority of the qualitative dimensions for the bioresources project indicates that DPC is 'likely to deliver VfM' when compared to the in-house delivery route. The quantitative VfM analysis also indicates that the Bioresources project is 'likely to deliver VfM' under the DPC model. Delivery via DPC route offers a solution to mitigate potential resource constraints within our business by allowing to maintain focus on the broader capital programme.

DPC as a route to competition in bioresources

104. There is clear evidence of the potential to introduce competition in bioresources in the form of competition to provide project finance for bioresources infrastructures. A report on Bioresources Market Review[33] by Jacobs and published by Ofwat in May 2021, analysed the potential for development of the emerging Bioresources market based on the new bioresources price control. The report identified six potential market opportunities for bioresources, which includes project finance. Project finance, which is comparable to DPC, was highlighted as an opportunity with medium potential, and an important route to procuring capacity on the open market where third parties bring efficiency or benefits that incumbents struggle to obtain.

105. Ofwat's objective in treating bioresources infrastructure separately is to develop a market for bioresources with the added benefit of developing low-carbon energy generation, the revenue from which can be applied to reduce water bills. In our view, delivering the Bioresources project under the DPC model is consistent with that ambition and would assist in developing the market for long term investment in the sector.

[30] Ofwat, May 2021, Review of the bioresources market – consultation, page 11, SOC-4-0014.
[31] Southern Water, August 2024, SRN-DDR-039: Market Based Delivery, page 63, SOC-4-0011.
[32] Southern Water, August 2024, SRN-DDR-039: Market Based Delivery, page 196, SOC-4-0011.
[33] Jacobs, May 2021, Bioresources Market Review, SOC-4-0015.

106. Ofwat has consistently highlighted the benefits of competition within the bioresources market, as evidenced in publications such as the Water 2020 report (May 2016)[34] and their market study on organic waste conducted by OFT (September 2011).[35]

107. Following the Water 2020 report, Ofwat refined its regulatory approach for bioresources and included a separate binding price control to enhance transparency and drive commercial arrangements, incentivising water companies to seek efficient bioresources management options.[36]

108. Subsequently, Ofwat proposed shifting its cost challenge basis to an average revenue per tonne of dried solid sludge (**TDS**), similar to the "gate price" approach used in the waste sector. This results in a regulated price for sludge, rather than a market price.

109. The market has indicated a strong preference for certainty of payments like that of an ARD,[37] which supports revenues under the DPC model. The ARD provides a strong degree of revenue certainty, with the certainty expending beyond a single regulatory control period. Adoption of DPC (with the associated ARD) for bioresources would provide the necessary stability for investors.

110. From our market engagements and value for money assessments, there is evident potential to introduce competition in bioresources in the form of competition to provide project finance for bioresources infrastructures. This could be achieved through adopting DPC for bioresources.

111. In the circumstances, we request that the CMA make a redetermination that our Bioresources project be taken forward under the DPC regime. This would be consistent with the CMA's duty to protect the interests of consumers wherever appropriate by promoting competition.

4.2.3. DPC - Additional considerations

112. DPC offers a strategic solution to mitigate potential resource constraints for us. The third-party appointed to be the CAP under DPC will possess extensive experience in delivering the Bioresources projects, enabling them to efficiently assemble the necessary partners and subcontractors for successful project execution. The third-party will have the potential to introduce a diverse pool of suppliers beyond our current network, expanding options and mitigating potential constraints.

113. The third-party will likely have the ability to engage with a broad spectrum of investors in the market, exploring a variety of financing options to support project costs. This approach enables the identification of new funding sources that may offer more competitive terms. Financing would be customised to the specific needs of the project, allowing for efficiencies, including the potential for higher gearing compared to a notional company structure.

114. Our AMP8 plan is our largest investment programme to date, including £3.3 billion enhancement investment, the largest in our history and among the biggest in the sector. Reallocation of the Bioresources project to a competitive delivery route like DPC can be expected to lessen our deliverability and financeability burden by helping with resource constraints and the requirement for us to finance the project in its entirety.

115. DPC enables price discovery, risk identification, and mitigation throughout the project's lifecycle along with an opportunity to exceed our baseline obligations, achieving greater environmental and social impact. The DPC model is expected to align customer billing with service availability and reduce bill volatility.

[34] Ofwat, May 2016, Water 2020: our regulatory approach for water and wastewater services in England and Wales, page 6, SOC-4-0016.
[35] Office of Fair Trading, September 2011, Organic waste An OFT market study, SOC-4-0017.
[36] Ofwat, Bioresources market, SOC-4-0018.
[37] Southern Water, August 2024, SRN-DDR-039: MarketBased Delivery, page 63, SOC-4-0011.

116. **We have undertaken value for money analysis and undertaken market engagement research. Both show that delivery of the Bioresource project under DPC would likely deliver benefits to customers**. As such, we request that the CMA make a redetermination that our Bioresources project be taken forward under the DPC regime.

5. Error 3 – Undefined Parameters

5.1. Approach to notified items

117. As noted above, 'notified items' provide an opportunity for revenues to be re-opened mid-price control period provided certain conditions are met. One such condition is that net cost increases exceed a specified materiality threshold. That threshold is currently set in our licence at 10% of revenues. The FD provides for notified items for nine areas (see the following section below).

118. In the FD, Ofwat states that it intends to design bespoke criteria that make it easier for companies to access additional revenue in-period, if necessary, for these critical areas of investment. To enable that, Ofwat intends to consult on necessary changes to Condition B of our licence.[38] This consultation would include details on how the notified items process would work, and the materiality threshold that would apply.

119. In the FD, Ofwat suggests that it might lower the materiality threshold from 10% to ('at most') 2%. [39] However, at the time when we had to decide whether to accept the FD or trigger a redetermination by the CMA, this threshold had not been confirmed. At the time of writing, it remains unconfirmed.

120. The difference between these two thresholds is highly material. As set out in the FD, Southern Water's average annual revenue in AMP8 is £1.3 billion. This means that a 10% threshold would equate to c.£130 million, while a 2% threshold would equate to c.£25m.

121. The difference between the two thresholds represents an incremental RoRE risk of 1.2%.[40]

122. It is also unclear whether there will be any restrictions as to when a company can seek to use the new notified item approach. In the FD Ofwat stated:

> *"Unlike the existing interim determination process, we expect that the process will not be available for all cost areas in every year of the control period. For example, the process may only be required in one year of the control period for costs associated with large schemes or PFAS."*[41]

123. Ofwat's statement draws into question when companies could apply for a notified item, without providing any firm conclusion.

5.2. Errors with the approach to notified items

124. The cost areas that Ofwat has identified as notified items in the FD are significant and are associated with highly uncertain costs. In each case, there is a significant likelihood that changes in cost during AMP8 will exceed a £25 million materiality threshold. A summary of the different factors likely to influence costs in each case is set out below.

[38] Ofwat, December 2024, PR24 final determinations: In-period adjustments, page 17, SOC-4-0029.
[39] Ofwat, December 2024, PR24 final determinations: In-period adjustments, page 18, SOC-4-0029.
[40] Impact on return on regulated equity for an average year in AMP8 based on overspend post cost sharing.
[41] Ofwat, December 2024, PR24 final determinations: In-period adjustments, page 17, SOC-4-0029.

Table 7: FD Notified Item summary and description of uncertainty

Notified item	Description of the potential cost uncertainty
Cyber security	The current scope of work is based upon the known threat and legislative environment, meaning any changes to these are uncertain. There is a high level of uncertainty, and potential changes include: - Legislative changes: o Increase to the number of CNI sites in scope o Increase in scope to include wastewater sites o Increase to the level of protection technologies required by legislation – updates to the Cyber Assessment Framework, and therefore eCAF are expected this year, which will mean an associated increase in our cyber protection. - Change in threat and risk: This would result in enhancements to our current cyber capabilities to combat the threat, such as an increase in physical security presence or use of additional protection technologies. Such threats could be due to political instability, international conflict, new vulnerabilities or changes to our risk position.
Per- and poly fluoroalkyl substances (PFAS)	PFAS is an 'emerging contaminant' which doesn't currently have a legal limit within drinking water regulation in the UK. It's long-term impacts on human health are also currently unknown. It is anticipated that a new legal limit will be determined and applied during AMP8. Uncertainties in the area include the following: • Future legal limit unknown – the DWI has not proposed a legal limit. • Risk understanding is still being developed due to limited sample data – we have a lot of data, but only for a short period of time. Intermittent discharges may not show in our current records. • Variation between the chemistry of the compounds – a large range and variety of PFAS compounds: • Toxicological limits are likely to vary depending on the compound (currently they are all being assumed to have the same human health impact). • Design of site specific treatment processes is uncertain, there is potential for over-engineering to ensure removal of compounds. Both capex and opex are affected by implementation of new PFAS limits. We are likely to need to install granular activated carbon (**GAC**) treatment at a number of sites. The media in the GAC vessels will need to be frequently replaced to maintain the levels of treatment. Currently five sites are in Tier 3 and 22 sites in Tier 2. The potential range of costs could be as follows: • Maximum: All current Tier 2 and Tier 3 sites require installation of GAC, which would mean 19 sites are improved at a cost of £10 million each, which would total £190 million, plus £0.5 million opex for media per site p.a., plus enhanced sampling at £0.2 million p.a. There is an assumption that the sites with GAC installed or that have GAC installation in AMP8 will not need

	further work, but this is not certain, the costs of which could be another £50 million. • Likely: Sites with detections at 20 ng/l or above, which reduces the number of sites by four to 15. • Minimum: Installation of GAC at one site and increased opex for enhanced monitoring at all Tier 2 and Tier 3 sites, which would cost £10 million capex plus £0.5 million Opex for media p.a. plus enhanced sampling at £0.2 million p.a.
Costs resulting from changes to the legal requirements in respect of sludge spreading	We currently have the smallest landbank area when adjusted for population and thus face higher pressure than the rest of the industry to find an alternative solution to sludge spreading. Changes to the EA's interpretation of Nitrogen and Phosphorous management could be enforced either as part of the Farming Rules for Water or the EA's future sludge strategy. This could result in major changes to the amount of sludge sent to landfill and/or incinerated.
Changes in charges payable under the Havant Thicket Agreement	At PR19, Portsmouth Water (**PW**) was set a 10-year price control for financing and constructing the Havant Thicket reservoir, which will enable a bulk supply transfer of water from PW's network to SWS. SWS's customers are to pay PW for this via a Bulk Supply Agreement. Ofwat allowed PW £124 million (in 2017/18 prices). However, recognising the early stage of project development at PR19, and therefore the uncertainty around project planning and costs, a Cost Adjustment Mechanism (**CAM**) was provided. After receiving evidence from PW on a more mature reservoir design and higher than expected supply chain costs, Ofwat agreed under the CAM to increase PW's allowance to £310 million (in 2017/18 prices). The CAM will be implemented through an in-period adjustment at PR24. This should update both PW's and SWS's allowances, as SWS is paying for the entirety of the project, with PW financing and delivering the project. A second cost adjustment mechanism (**CAM2**) is expected to be implemented to account for further cost increases to the project. Factors increasing the cost of constructing the reservoir include alignment works PW are completing to enable SWS's Hampshire Water Transfer and Water Recycling Project and the impact from unforeseen geological challenges. Although the final CAM2 amount is not yet known, it is expected to be in aggregate greater than £650 million. The current timeframe for the CAM2 review from Ofwat is June 2025. This is likely to lead to a significantly greater revenue requirement within 2025-30.
WTW1 and WTW2 Water Treatment Works scheme	These relate to [redacted](see the section on schemes not included in the relevant mechanism for further details).
Hastings & Isle of Sheppey resilience scheme	Both schemes relate to investment required to address specific local issues relating to system resilience whereby Southern Water's customers have experienced substantive outages due to the failure of key assets. The solutions are expected to be substantial schemes, forming part of a programme of works in each area. Options for each area are under development and therefore have a high level of uncertainty at this stage.

Sandown WTW reuse scheme	The Sandown project involves constructing a new water recycling plant at Sandown's wastewater treatment works, along with pipelines to discharge into the River Yar. Due to its location on the Isle of Wight, the project faces challenges such as higher logistics costs for importing materials and housing non-local labour. The site is also within an Area of Outstanding Natural Beauty, requiring additional environmental surveys and careful scheduling to minimise disruptions. Furthermore, the plant will treat raw sewage, necessitating a full treatment process, including additional nutrient treatment to meet discharge standards, increasing the project's complexity and cost uncertainty.
Sittingbourne industrial reuse scheme	There are significant risks and issues that will need to be addressed as the project is developed, including: • We will require a commercial agreement where [redacted] accepts the relinquishment of its groundwater license with the demand being met with recycled water. • We currently do not have a site at which to locate the Water Recycling Plant (**WRP**) or the groundwater treatment works and there are significant challenges around the pipeline routes, designations and residential development due to the congested nature of the area. • We, along with [redacted] will need to engage with the EA to agree a way to transfer the borehole licenses from DS Smith to us. Additionally, we will need to have some assurance that the abstraction license and flow / volume from the boreholes will be available for a considerable period of time. • Additionally, we assume that the WRP's reject stream can be discharged through the existing outfall at Sittingbourne WTW with a discharge license granted by the EA.
Whitfield scheme	While developing the project there are several risks we need to continue to assess, including: • The project requires new operating and discharge permits from the EA. • As part of a major scheme, there is a risk of delays due to the need for full planning permission. • There are likely to be significant complexities and possible delays due to the need to cross underneath a major road (A256) and a railway. • We may be required to construct a new long sea outfall if we are unable to connect the flows to the existing Broomfield Bank LSO. • An EIA is likely to be required for both the treatment site and the transfer pipeline. Ecological surveys would also be required for work across fields.

125. We agree with Ofwat that the above schemes are highly uncertain and should be subject to an uncertainty mechanism such as notified items. We also agree with Ofwat's 'current working assumption' that a lower materiality threshold of (at most) 2% should apply.[42]

126. Ofwat has not confirmed its position on the correct materiality threshold. Absent this confirmation, we cannot assess whether there is an appropriate set of uncertainty mechanisms in place, or

[42] Ofwat, February 2025, PR24 final determinations: Major projects development and delivery, page 38, SOC-4-0013.

whether the company will be exposed to up to £130 million of unfunded costs relating to uncertain factors outside of our control.

127. The costs associated with changes in charges payable under the Havant Thicket Agreement are a particular immediate issue of concern. It is expected that Portsmouth Water will confirm major cost increases associated with the Havant Thicket reservoir in the summer of this year, meaning that we will be liable to make increased payments from 2026/27 onwards.

128. In recent correspondence with Ofwat, Ofwat stated that it *"won't be possible to do anything that involves a licence* change *e.g. the bespoke iDoK which we are consulting on this year. That applies across the Board for anything that would require a licence change."*[43] This seems to be because Ofwat is concerned with overlapping with the CMA process.

129. We consider this, in this particular instance, to be an unfounded concern. We agree with Ofwat's stated working assumption set out in the FD (i.e., to reduce the materiality threshold to (at most) 2%). It Ofwat were to make the associated licence change, then this specific ground for appeal would fall away. Ofwat could then assess any cost increase associated with the Havant Thicket Reservoir (along with any other notified item-related claims) outside of the CMA process, enabling the CMA to focus on the other issues raised by companies in their Statements of Case.

130. It would seem incongruous for Ofwat to make licence changes for all the water companies that did not seek a re-determination, while leaving the notified item process unconfirmed for Southern Water – a company that is likely to need to use the process in the first year of the control period (and beyond).

131. The fact that Ofwat is not enacting the position that it set out in the FD (at least for the first year of the control period) serves to illustrate the overarching issue. The regulatory framework for notified items is not sufficiently confirmed for AMP8.

132. Insofar as Ofwat confirms the (at most) 2% materiality threshold prior to the completion of the CMA's re-determination, we would support this ground being deprioritised from the CMA's assessment. That assumes that Ofwat's other changes to the standard notification process are consistent with this reduction in materiality threshold and that it commits to making the necessary licence modifications.

133. If, however, Ofwat does not provide this confirmation, we request that the CMA's redetermination mandates that Ofwat implements for Southern Water the lower materiality threshold of (at most) 2% as contemplated (but not confirmed) in the FD.

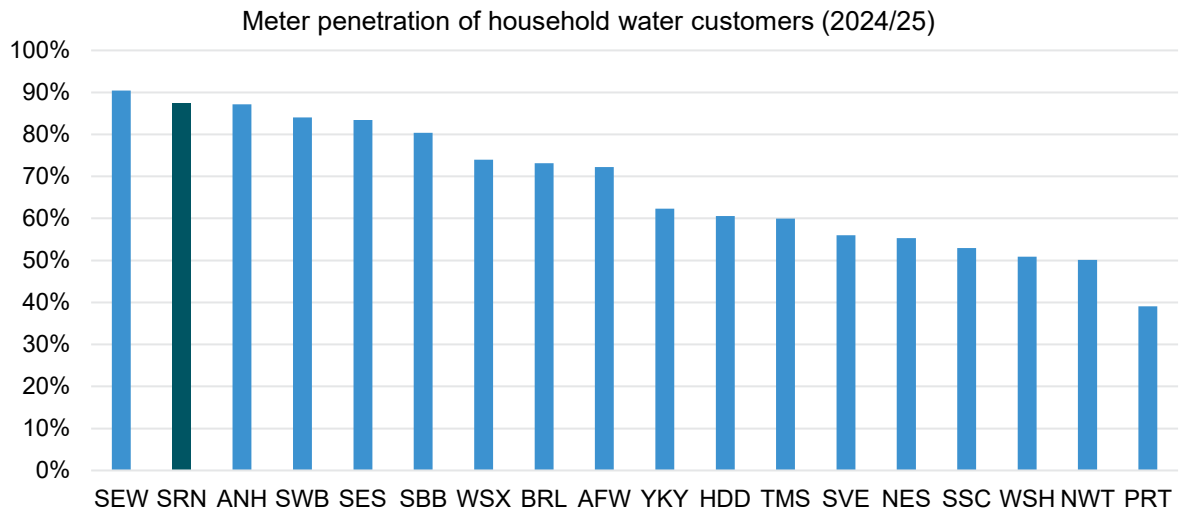
6. Error 4 – omitted mechanism

6.1. Approach to the smart metering uncertainty mechanism

134. Due to operating in a water scarce region, we have a relatively high level of meter penetration (that is, the proportion of properties served that have a water meter). We are the second highest in the sector, and the highest out of all the water and sewerage companies. This is illustrated by the table below.

[43] Ofwat, March 2025, Email - Subject: "RE_ Ofwat_SRN - update on bespoke iDoK", SOC-4-0032.

Figure 1: Meter penetration of household water customers (2024/25)



135. We have a large smart metering programme. When installing smart meters, the boundary box often needs to be replaced to ensure compatibility with the meter. Older boundary boxes may not be designed to accommodate modern meters, lacking the necessary space, ports, or structural integrity to house them securely. Additional boundary boxes may require replacement because they sustain damage during installation of a new meter (e.g. when dealing with the units unscrewing and reinstalling meters can lead to cross threading, cracked units and other defects emerging, which are difficult to distinguish from defective boundary boxes).

136. We were the first water company to progress with a universal metering programme. As part of which, we installed boundary boxes suitable for the meters then available on the market. This was prior to smart meters being a viable option. Companies with more recent meter programmes could have foreseen that smart meters were coming and pre-emptively installed smart-meter ready boundary boxes. At the time of our universal metering program this was not the case.

137. At the time of our October 2023 business plan submission, we did not have evidence about the condition of our boundary box assets and, therefore, did not claim funding for replacing boundary boxes. Since then, we have gathered evidence on the need for boundary box replacement to understand the potential associated risk. This was presented in our DD Response.[44]

138. Whether it is necessary to replace the boundary box is typically determined only when we are on site and are able to physically assess the asset. This means that in developing our cost forecasts, we need to provide an estimate of the number of boundary boxes that will need to be replaced.

139. In our DD Response, we proposed an uncertainty mechanism to reflect the uncertainties in this estimate. The mechanism would adjust our allowed revenue (up or down) should a different number of boundary boxes be required to be delivered.

140. Our proposal was rejected by Ofwat in the FD.

[44] Southern Water, August 2024, SRN-DDR-031: Water Resources – Smart Metering Enhancement Cost Evidence Case, SOC-4-0030.

6.2. Errors with the FD

141. Our analysis, based on 7,100 surveys commissioned with Morrison Data Services, indicates that 6.7% of our boundary boxes across our region may require excavation and reinstatement prior to the replacement of an aged meter asset.

142. Our collaboration with other water companies who have aged boundary box estates has confirmed that there is significant uncertainty over the volume of likely boundary box replacements, some estimating that as many as 35% of meter replacements will first require a boundary box replacement.

143. Should we need to replace 35% as opposed to 6.7%, we would incur an additional c.£180 million of costs (an impact to RoRE of up to 2.0%[45]). This would represent a major unfunded requirement.

144. In the FD, Ofwat rejected our proposal for a boundary box replacement mechanism, stating:

> *"Replacement of boundary boxes already covered through metering sector wide cost adjustment and accompanying PCD. The unit rate used to determine the cost adjustment reflects a mix of meter replacement work based on assumptions made in company's business plan. Cost sharing sufficiently mitigates the risk that companies need to deliver a more or less complex mix of work than forecast."*[46]

145. The FD is erroneous in this regard:

- The 'metering wide cost adjustment' does not address uncertainty in replacement volumes. It provides a simple unit rate-based allowance without any allowance for uncertainty in the boundary box costs – indeed, overall for metering, the FD cost allowance was £26 million less than our business plan proposals.
- The PCD also does not address boundary box uncertainties. On the contrary, the PCD provides for a clawback if a specific volume of meters is not delivered. This does not relate to boundary box volumes, and provides no scope for additional funding should volumes increase.
- While cost sharing rates do provide some degree of mitigation, these are not sufficient to address a potential £180 million risk that is outside of company control. A 50:50 cost sharing rate still leaves the company exposed to £90 million of risk, as well as having to manage the full cash flow implications of any shortfall until PR29.

146. The omission of an uncertainty mechanism for boundary boxes creates a material risk for Southern Water that arises from factors outside of the company's control.

7. Remedies

147. The remedies required to address the uncertainty mechanism issues identified in this Chapter are set out below. We request that the CMA makes a redetermination that gives effect to these remedies.

Error 1 – incorrect specification of the delivery mechanism

148. The DM, as specified in the FD, creates material downside-only risk which is not reflected in returns. The mechanism provides a clear disincentive for timely delivery, and risks the company not being funded to deliver key statutory outputs.

[45] Impact on return on regulated equity for an average year in AMP8 based on overspend post cost sharing.
[46] Ofwat, February 2025, PR24 Final Determinations Expenditure allowances, page 349-350, SOC-1-0006.

149. Therefore, the required remedy is to **amend the specification of the DM.** The DM needs to be made a within-period re-opener mechanism where cost allowances can be amended either upwards or downwards based on the latest available information, and (under Condition B of the licence) giving SWS the ability to appeal the within period re-opener to the CMA if required. We consider the easiest way to do this it to- specify the delivery mechanism as a notified item.

Error 2 – schemes not included in the relevant mechanism

2a Large scheme gated process

150. The FD did not allocate three major water supply resilience schemes ([redacted] and Weir Wood) to an uncertainty mechanism which would protect both Southern Water and customers from the risk of over/under funding due to scope changes. This is despite the scope for these schemes being at an early stage of maturity with the result that costs are highly uncertain,

151. Therefore, the required remedy is to **allocate these three schemes to the large scheme gated process**. We propose a single programme (encompassing [redacted] and Weir Wood) to progress through the process due to the interconnected nature of the schemes.

2b Direct Procurement for Customers

152. The FD did not allocate our Bioresources AAD project for competitive delivery despite robust evidence of value for money for customers and market interest.

153. The required remedy is that our Bioresources AAD project be **taken forward under the DPC regime**.

Error 3 – undefined parameters

154. Notified items provide an opportunity for revenues to be re-opened mid-price control period provided certain conditions are met. One such condition is that net cost increases exceed a specified materiality threshold.

155. In the FD, Ofwat suggests that it might lower the materiality threshold from 10% to (at most) 2%. However, this threshold has not been confirmed, and Ofwat has informed us that it will not seek to make any such licence change in the first year of the control period for us (while consulting on doing so for others). Absent this confirmation, we cannot assess whether there is an appropriate uncertainty mechanism in place, or whether the company will be exposed to up to £130 million of unfunded costs relating to uncertainties outside of our control.

156. Therefore, the required remedy is for the CMA to **confirm that the notified item materiality threshold will be reduced to (at most) 2%**.

157. Insofar as Ofwat confirms the (at most) 2% materiality threshold prior to the completion of the CMA's re-determination, we would support this ground being deprioritised from the CMA's assessment. That assumes that Ofwat's other changes to the standard notification process are consistent with this reduction in materiality threshold and makes the necessary licence modifications.

Error 4 – omitted mechanism

158. The omission of an uncertainty mechanism for boundary boxes creates a material risk for Southern Water that arises from factors outside of the company's control.

159. Therefore, the required remedy is to **introduce an uncertainty mechanism for smart metering boundary box costs**. This uncertainty mechanism should be linked to the number of boundary boxes required so that our cost allowances increase at an agreed rate should we need to carry out a greater volume of work (that is, replace more boundary boxes).

Chapter 5
Price Control Deliverables (PCDs)

PCDs

1. Introduction

1. Ofwat introduced price control deliverables (**PCDs**) as a new mechanism for PR24. The PCD framework prescribes deliverables for each company, predominantly in the form of outputs. Most PCDs relate to enhancement expenditure but some relate to base.

1.1. Errors

2. We agree that it is in customers' interests to require companies to refund enhancement allowances for projects which companies do not ultimately deliver. However, we have significant concerns with the design of the PCD framework in the FD:

- **Error 1**: The framework is excessively punitive and inflexible: It requires a company to repay an allowance wherethe relevant output is not delivered on time, notwithstanding that the company may be well advanced in their delivery of the output. It fails to recognise that reasons for delay or non-delivery may be beyond the company's control and that delays may not have a material impact on customer outcomes. It imposes prescriptive output-based deliverables, with no general mechanism to permit changes to outputs or delivery dates;
- **Error 2**: The design of the PCD framework introduces deliverability risk, creating a significant RoRE downside skew on a notional company basis and, even more significantly, on a Southern Water-like notional company basis.
- **Error 3:** The imposition of PCDs on base expenditure is distortive: by ring-fencing a significant proportion of botex allowances for PCD deliverables, the remaining botex allowance is not sufficient to enable the company to maintain a base level of service to customers. Ring-fencing removes the flexibility that companies need to redirect expenditure most effectively to deliver outcomes and benefits.
- **Error 4:** The outputs-focussed PCD framework conflicts with the aims of the existing outcomes-based regulatory approach: Its design risks creating perverse incentives by discouraging efficiency and innovation.
- **Error 5:** The PCD framework creates a risk of overlapping penalties: Failure to deliver a PCD output may additionally lead to ODI penalties and/or financial penalties arising out of enforcement action for non-compliance with statutory or regulatory obligations.

1.2. Impacts

3. The PCD framework in the FD creates significant deliverability risk for a notionally efficient company operating in the Southern Water region. On a P50 basis, the enhancement PCD risk with has a negative value in excess of £58 million across AMP8 (base PCD risk has not been quantified financially at this stage\0.

1.3. Remedies

4. We believe that a redesign of the PCD framework is required so that it delivers for customers while not giving rise to disproportionate risk for companies. We ask the CMA to determine a PCD framework with features which include:

- **A true non-delivery PCD mechanism:** which is limited to cases where companies fail to commence or otherwise cancel the delivery of the output. It would not be triggered where delivery is delayed.
- **A two-way time incentive PCD:** under which a late delivery penalty would apply where companies fail to deliver outputs by the prescribed delivery date. A reward would be available for early delivery. (A within-AMP time-incentive penalty is not appropriate given the limitations it would impose on company's ability manage its capital programme.)
- **A within-AMP adjustment mechanism:** under which a company may request Ofwat to modify a PCD in respect of outputs and/or delivery dates so as to reflect certain within-AMP developments.
- **An offset mechanism:** to address the financial double penalty associated with overlaps between PCDs and ODIs. The PCD penalty would be reduced by an amount equal to any ODI payment associated with a failure to deliver the relevant PCD output.
- **Modifications to the specification of base expenditure PCDs for mains renewal and network reinforcement:** to ensure that base PCDs apply only to activities funded by specific cost adjustments made by Ofwat in the FD (and not to activities funded by the implicit allowance).

1.4. Background to the PCD framework

5. Ofwat has introduced PCDs as a new mechanism for PR24. Ofwat applied a significantly narrower version of the mechanism at PR19 in the form of scheme specific performance commitments, to protect customers from non-delivery of material enhancement investment in areas where there is no regulatory oversight from other regulators. At PR24, Ofwat adopts a significantly broadened PCD framework.

6. Alongside increased reporting and assurance requirements, the key objectives of PCDs, as set out in the FD are stated by Ofwat to be:

   - to protect customers where companies fail to deliver funded improvements by returning funding to customers; and
   - to incentivise companies to deliver 'on time' by applying underperformance payments where companies deliver late and applying outperformance payments where companies deliver early.[1]

7. Ofwat first proposed the introduction of PCDs in its May 2021 framework consultation to *"[follow] Ofgem's approach*". It would introduce PCDs which would "*link funding to specific outputs*" and then use these to "*review delivery at PR29 and to take action if there is non-delivery*".[2]

8. Further, in the PR24 Draft Methodology, Ofwat provided that the objective of PCDs would be to:

   > "*set out the key outcomes or outputs of enhancement expenditure, so that stakeholders and customers know what to expect from the funding provided. Where these outcomes or outputs are not delivered, PCDs allow funding to be returned to customers*."[3]

9. Ofwat developed further its approach to PCDs in its PR24 Final Methodology in December 2022. It explained that Ofwat expected companies to identify how customers will be protected against both

[1] Ofwat, February 2025, PR24 final determinations: Expenditure allowances, page 306, SOC-1-0006.
[2] Ofwat, May 2021, PR24 and beyond: Creating tomorrow, together', Framework Consultation, page 90, SOC-5-0001.
[3] Ofwat, July 2022, Creating tomorrow, together: consulting on our methodology for PR24 - Appendix 9 Setting expenditure allowances, page 116, SOC-5-0002.

non-delivery as well as 'under' delivery of funded enhancements. It set out that PCDs are intended to "*hold companies to account for the timely delivery of the outcomes and outputs they promise*."[4]

10. Ofwat also set out the following principles on which PCDs should be based, namely that PCDs should be:

- used where benefits of the investment are not linked to or fully protected by Performance Commitments (**PCs**);
- used to protect customers for material enhancement investments;
- where possible, set at an outcome rather than output level; and
- set at the highest level possible to retain flexibility over the benefits to deliver using the most efficient solutions.[5]

11. Subsequently in July 2023, Ofwat set out its granular guidance on how PCDs should apply, which represented an expansion of Ofwat's original position on the approach to PCDs, as set out in the PR24 Draft Methodology.[6] Here, Ofwat proposed that:

- In respect of **non or partial delivery**, PCDs would allow "*funding to be returned to customers*" where companies fail "*all or some*" of the funded outcomes by the end of the control period[7];
- In respect of **late delivery**, PCDs would "encourage timely delivery", for example through "*the use of a time incentive payment per month/year per unit of output or outcome that is not delivered on time*".[8]

12. The following section explains the key features of the PCD framework as set out in the FD.

1.5. Features of the PCD framework in the FD

13. The PCD framework[9] in the FD is comprised of three key components, namely:

- Non-delivery PCDs;
- Time incentive PCDs; and
- Late delivery PCDs.

Each component is described in turn below.

1.6. Non-delivery PCDs

14. Non-delivery PCDs are a major component of the PCD framework. These prescribe deliverables for a large proportion of each companies' enhancement expenditure, as well as certain elements of their base expenditure. Most deliverables are in the form of specified outputs. [10]

15. For PCDs relating to enhancement expenditure, Ofwat sets the PCD deliverables at either a scheme level (e.g. storm overflows and phosphorus (**P**)-removal) or at a programme level, covering

[4] Ofwat, December 2022, Creating tomorrow, together: Our final methodology for PR24 - Appendix 9 Setting expenditure allowances, page 118, SOC-5-0003.
[5] Ofwat, December 2022, Creating tomorrow, together: Our final methodology for PR24 - Appendix 9 Setting expenditure allowances, page 118, SOC-5-0003.
[6] See paragraph 8 above.
[7] Ofwat, July 2023, IN 23/05 Further guidance on price control deliverables for PR24, page 8-9, SOC-5-0004.
[8] Ofwat, July 2023, IN 23/05 Further guidance on price control deliverables for PR24, page 9, SOC-5-0004.
[9] Ofwat, February 2025, PR24 final determinations: Expenditure allowances, pages 306 - 315, SOC-1-0006.
[10] A limited number of PCDs have outcome-based deliverables.

a number of individual schemes or aspects of each companies' programmes (e.g. wastewater investigations and sludge storage).

16. For PCDs relating to base expenditure (including for mains renewal and network reinforcement), Ofwat sets PCD deliverables at a programme level with sub-category specificity. For example, deliverables for the PCD in respect of mains renewal includes a requirement to prioritise Condition Grade 4 and 5 mains.

17. The required deliverables are specific to each company. In light of the differences between each companies' programme, the PCD framework applies differently to each company.

18. Non-delivery PCDs apply to material investments, defined by Ofwat as investments representing at least 1% of the companies' relevant total expenditure.[11] In a change to Ofwat's position in the DD, non-delivery PCDs also extend to investments which fall below the materiality threshold as follows:

- material investments which represent "*slightly short*" of 1% of the companies' relevant total expenditure;
- trial schemes funded by customers;
- carry over schemes where companies are forecasting to not deliver schemes by the end of the PR19 period;
- schemes where costs are assessed at scheme level;
- WINEP investigations; and
- schemes where there is no regulatory oversight other than from Ofwat.[12]

19. The FD states that PCDs will apply to around 80% of allowed enhancement expenditure.[13]

20. PCDs also apply to aspects of companies' base expenditure. For Southern Water, PCDs apply in respect of base expenditure for mains renewal and network reinforcement. Ofwat introduced PCDs for base expenditure in its DD with no prior consultation with companies, having previously stated in the PR24 Final Methodology that PCDs "*protect customers against potential non- or partial delivery of PR24 enhancement schemes*" (emphasis added).[14]

21. The required delivery date for outputs subject to non-delivery PCDs is generally the end of AMP8 – i.e., the end of the regulatory period to which the PR24 Final Determination relates. There is no mechanism to adjust the required delivery date to align with the delivery dates prescribed by quality regulators (e.g., the EA and DWI) for the same or similar outputs.

22. Non-delivery PCD payments will be triggered where companies fail to deliver the required PCD output by that date. Non-delivery PCD payments will be assessed as part of the PR24 reconciliation at PR29.[15]

23. Where companies have not delivered the relevant benefit by the end of the control period but are on track to deliver the benefit "*within [a] few months*" from the start of PR29, Ofwat will allow companies to request a waiver on the application of non-delivery PCD payments. As explained at paragraph 36 below, Ofwat will apply a late delivery payment from AMP9 to discourage any further delay.

[11] The relevant total expenditure is based on total allowed wholesale water totex for water enhancements and total allowed wholesale wastewater totex for wastewater enhancements (pre frontier-shift adjustment).
[12] Ofwat, February 2025, PR24 final determinations: Expenditure allowances, page 309, SOC-1-0006.
[13] Ofwat, February 2025, PR24 final determinations: Expenditure allowances, page 313, SOC-1-0006.
[14] Ofwat, December 2022, Creating tomorrow, together: Our final methodology for PR24 - Appendix 9 Setting expenditure allowances, page 45, SOC-5-0003.
[15] Ofwat provided a draft reconciliation model with the FD. However, Ofwat has not yet provided any detailed guidance on how PCDs will be reconciled in respect of revenues and allowances.

24. By way of exception, for non-delivery PCDs relating to DWI requirements[16], a scheme may have a prescribed delivery date which is after the end of AMP8. Here, any non-delivery payment will be applied at the end of the AMP9.

25. In cases where companies fail to deliver outputs by the required delivery date, Ofwat will allow companies to retain up to 6% of the allowance (to cover development costs) but only in circumstances where companies can demonstrate that:

- under-delivery is due to an investment no longer being required in both the short and long-term; and
- there are material benefits to customers from stopping the investment.

26. However, this relief will be available only where cost savings to customers from not applying the full claw-back meets a materiality threshold of 1% of the wholesale totex in the relevant enhancement area. The FD does not provide a detailed explanation of how this materiality threshold will apply, although it is noted that Ofwat will set out further guidance on this condition in due course (such guidance is awaited). In response to Wessex Water's request that companies are allowed to retain all efficiently incurred costs, Ofwat stated that the 6% figure, was in line with its view of efficient development costs allowed in other areas of the assessment, such as in respect of strategic resources.[17]

1.7. Time incentive PCDs

27. Time-incentive PCDs are directed at encouraging timely within-AMP delivery. They are two-way, in that they reward early delivery[18] and penalise late delivery.

28. The penalties or rewards are determined on the basis of company performance with respect to the delivery of outputs relative to a within-AMP delivery profile specified by Ofwat in the FD. So, for example, we might be required to deliver 20% of target outputs for the AMP by the end of year 1, 40% by the end of year 2, 60% by the end of year 3, and so on.

29. Time-incentive PCDs are concerned exclusively with delivery within AMP8. This means that where a non-delivery PCD extends into AMP9 (as is the case for our scheme-level PCD for storm overflow equivalent storage), any time-incentive PCD associated with that deliverable has no application to the delivery of scheme outputs within AMP9.

30. Time-incentive PCDs apply in addition to non-delivery PCDs – that is, they are cumulative.

31. Time-incentive PCDs apply only to a sub-set of enhancement programmes in the FD. In respect of our enhancement programme, time incentive PCDs apply to the following areas:

- mains renewal;
- storm overflow schemes;
- P-removal;
- water supply interconnectors;
- water supply schemes;
- metering; and
- PR19 WINEP carryover actions.

32. The FD states that time incentive PCDs apply to around 50% of enhancement expenditure.[19]

33. The time incentive PCD penalty rate is calculated based on an underperformance rate of 3.97% (i.e. equivalent to the wholesale WACC) multiplied by the unit allowance. This penalty rate is

[16] Raw Water Deterioration, SEMD and NIS (Cyber) PCDs.
[17] Ofwat, February 2025, PR24 final determinations: Expenditure allowances, page 313, SOC-1-0006.
[18] The FD refers to 'on time' delivery rather than early delivery. But under the mechanism set out in the FD, early delivery within the target year is required in order to trigger a reward payment. We therefore refer to early delivery in this SoC.
[19] Ofwat, February 2025, PR24 final determinations: Expenditure allowances, page 313, SOC-1-0006.

applied whenever a water company fails to deliver a relevant PCD output in accordance with the within-AMP delivery profile specified in the FD.

34. The time-incentive PCD also rewards early delivery, in accordance with the within-AMP profile specified in the FD. The early delivery outperformance rate is set as one third of the penalty rate. Ofwat concluded that there should be no additional reward for early delivery on the basis that it could lead to unintended effects, such as companies prioritising traditional solutions over nature-based solutions.

35. There are limitations to the application of time incentive PCDs in limited circumstances:

- In respect of all time incentive PCDs, companies will not face underperformance payments where 75% of the relevant benefit is delivered to schedule.
- In respect of our time incentive PCDs for water supply schemes and water supply interconnectors only, Ofwat allows a one-year grace period before time incentive underperformance rates will start to apply.[20]

1.8. Late delivery penalties

36. In addition to the non-delivery and time incentive PCDs, the FD imposes late delivery penalties in respect of all areas of expenditure subject to a non-delivery PCD. These late delivery penalties apply in the following circumstances where companies fail to deliver the required outputs by the end of AMP8:

- **Late delivery penalty where companies intend to deliver PCD outputs in the "first few months" of AMP9:**
  - As stated at paragraph 21, for PCDs with a delivery date at the end of AMP8, where companies have not delivered the relevant benefit by the end of the control period, but are on track to deliver the benefit "*within [a] few months*" from the start of AMP9, Ofwat will allow companies to request a waiver on the application of non-delivery PCD payments.
  - Where Ofwat agrees to hold back the non-delivery PCD payment, it will, however, apply a late delivery payment from 1 April 2030 (i.e. the beginning of AMP9) to discourage any further delay. This will accrue on a monthly basis for up to a maximum period of five years, and Ofwat will reserve the right to apply a non-delivery PCD if the company fails to deliver the benefit by the end of AMP9.
  - This late delivery is applied entirely at Ofwat's discretion, with no route for companies to challenge Ofwat's decision. It also applies irrespective of any delivery date agreed with a relevant quality regulator (EA or DWI).
- **Late delivery penalty where companies fail to deliver in AMP8 but are required to do so in AMP9:**
  - The penalty applies where companies fail to deliver an investment by the end of AMP8 and do not plan to deliver this investment during AMP9. The incentive is applied on a monthly basis for a period of up to five years until the investment is delivered, unless the companies can demonstrate that the relevant investment is no longer required both in the short and longer term.

[20] This grace period also applies in respect of the time incentive PCD for resilience interconnector schemes, however, we do not have a PCD for this area of expenditure.

- Although not stated explicitly in the FD, we assume that this penalty will apply in addition to a non-delivery payment for failure to deliver at the end of AMP8. It is not clear from the FD how this penalty will be applied in a situation where a company has not obtained allowances at PR29 for the relevant investment to be delivered during AMP9.

37. The FD does not explain how any late delivery penalties will apply in respect of PCDs relating to DWI requirements in circumstances where the delivery date falls within AMP9.

1.9. Overview of our concerns with the FD approach

38. We believe that the design of the PCD framework as set out in the FD, does not accord with the original objective of the PCD framework as presented by Ofwat, namely to protect customers where companies fail to deliver funded improvements by returning funding to customers.

39. We agree with that original objective. It is in customers' interests to require companies to refund enhancement allowances awarded for projects which companies do not commence or ultimately deliver. However, the design of the PCD framework in the FD is excessively punitive, inflexible and overly complicated, as well as extending significantly beyond Ofwat's original objective for the PCD framework.

40. As section 1.2 above shows, the design of the PCD framework is complex and intricate, with various exceptions and limited guidance. Such a framework would be difficult for companies to manage in a typical AMP. The challenge is exacerbated by the scale of companies' enhancement plans for AMP8. We have the highest degree of capital incentives (that is the ratio of enhancement spending to regulatory capital value (**RCV**)) of the sector in AMP8. Our AMP8 enhancement programme is over five times our AMP7 enhancement allowance, with many bespoke projects being at relatively early stages of the project development lifecycle. A PCD framework in the form set out in the FD will add significantly to the challenges of delivering that programme.

2. Error 1: The PCD framework is excessively punitive and inflexible

2.1. Overview

41. We do not challenge the principle that companies should return to customers allowances for projects which have not been and will not be delivered. However, we have significant concerns that the PCD framework set out in the FD is excessively punitive and inflexible. In particular:

- **The PCD framework is excessively punitive**: The non-delivery PCD mandates the claw back of allowances where the relevant output is not delivered by the end of AMP8 (and in limited circumstances, by the end of AMP9 – see paragraph 24). This is notwithstanding that the company may be well advanced in their delivery of the relevant output, having incurred significant costs to satisfy delivery as prescribed the PCD framework.

- **The PCD framework is inflexible**: The prescriptive specification of PCD outputs does not allow for necessary and appropriate changes that are in the interests of consumers and which may be required as a result of factors beyond companies' control. The PCD framework also fails to take account of changes to existing delivery dates which companies have agreed with the relevant quality regulator in respect of the same outputs in accordance with statutory or other regulatory requirements, in circumstances where that delivery date falls in AMP9 or beyond.

42. The punitive and inflexible nature of the PCD framework, as set out in the FD, is inconsistent with regulatory precedent as demonstrated by a comparison with Ofgem's approach to the PCD framework adopted in the RIIO-2 price control, and as proposed for the upcoming RIIO-3 price control period.

43. Each of these concerns are considered further below.

2.2. The PCD framework is excessively punitive

44. The non-delivery PCD mechanism will claw back allowances in full in the event of non-delivery by the required date, which for most purposes is the end of AMP8. This is subject to a delivery buffer of a "*few months from the start of PR29*", the terms of which are unclear from the FD.

45. Requiring companies to return an allowance in full in cases where the relevant output is not delivered on time is excessively punitive:

- **It fails to recognise that companies may be well advanced in their delivery of a relevant output at the end of AMP8:** Companies are likely to have incurred considerable expenditure on the relevant output at that stage. In those circumstances, requiring companies to repay the allowance for that undelivered output[21] is disproportionate and has the potential to leave companies with considerable unfunded expenditure. The FD approach takes no account of whether the company intends to deliver the remainder of PCD outputs in AMP9 and has already incurred significant costs to deliver the required outputs.[22][23]
- Companies will presumably be required to request the required allowances again as part of the PR29 price control review. In some cases, the majority of the allowance will have already been incurred during AMP8. It is not clear whether the amount of allowance spent in AMP8 would be allowed retrospectively at that stage, or whether any allowance would relate only to the additional spend to be incurred in AMP9. The company would have no certainty that Ofwat would make any allowance at all. This adds an unnecessary bureaucratic step in delivering essential infrastructure, given that Ofwat will have already assessed the allowed costs for a particular project as part of PR24.
- **It fails to recognise that reasons for delay or non-delivery may be beyond companies' control:** We explain in more detail at paragraph 51 below that there can be considerable uncertainty around achievement of the final outputs, which are highly dependent on factors beyond our control.
- **It fails to recognise that delay may not have a material impact on outcomes for customers:** In cases where companies intend to deliver PCD outputs but are delayed, companies must return allowances in full with nothing retained in respect of costs incurred, irrespective of whether the company has performed efficiently and in the customer interest in incurring those costs. This will apply regardless of whether or not the delay has any material impact on consumers, or whether the relevant quality regulator (e.g. EA or DWI) has agreed a change to a deadline for delivery that extends beyond the PCD delivery deadline.
- **It conflicts with existing regulatory and statutory obligations to deliver projects:** We already face an incentive to deliver projects on time as a result of our existing regulatory and statutory obligations, which can be enforced against by quality regulators (e.g., EA and DWI)

[21] By way of exception to this rule, Ofwat allows for retainment of up to 6% of allowances in respect of development costs in those cases where companies do not intend to deliver PCD outputs beyond AMP8 and can demonstrate that investment no longer required (in the short and long-term) and there are material benefits to customers from stopping the investment.
[22] Ofwat may waive the application of non-delivery PCDs, where the length of late delivery is a few months into AMP8. But that in no way assists for a project which is delayed even a short while beyond Ofwat's ill-defined grace period.
[23] The extent of this risk depends on the specification of the individual PCD. For PCDs relating to our DWI requirements (Raw Water Deterioration, SEMD and NIS), delivery is based on a single output. For these PCDs, we face the risk of clawback of our entire allowance where we have failed to deliver the required output on time, notwithstanding that significant costs may already have been incurred in respect of that output. By contrast, for the majority of programme-level PCDs, the relevant non-delivery payment rate is based on a unit cost (e.g. £ per km), which reduces the extent of the company's financial exposure to repaying allowances which have already been partly spent. For scheme-level PCDs, the company's risk exposure sits between these two extremes and depends on the detailed specification of the PCD output in the FD.

as well as Ofwat. The imposition of time incentive PCDs overlap with the delivery incentives under these existing obligations, which can result in conflicts.

- For example, in respect of our delivery of P-removal schemes, the scheme level PCD imposes a time incentive penalty set against the cumulative delivery of process capacity (measured in population equivalent (**PE**)). This sets a delivery profile beyond our statutory obligations to reduce P concentration by the statutory date of 2030 (as set out in the WINEP and agreed with the EA). The addition of these time incentive penalties is duplicative and unnecessarily punitive. Such penalties also bypass the role of the EA as the competent regulator responsible for determining how and when environmental schemes are delivered under the WINEP.[24] We provide more details of our concerns on the overlapping nature of our regulatory and statutory obligations at Error 5 below.

2.3. The PCD framework is inflexible

46. In the FD, Ofwat considered that the PCD framework will allow the companies "*some degree of flexibility*". As examples of this "flexibility", Ofwat referred to the position that PCDs are "*set at a programme level rather than at a scheme level*" and allow the companies to "*substitute between grey and green solutions to support companies going beyond their business plan and deliver more nature-based solutions*."[25]

47. Contrary to the impression which the FD seeks to convey, the PCD framework is very inflexible, and this creates significant delivery risk for companies.

48. At its heart, the PCD framework imposes prescriptive output-based deliverables, without any general mechanism to allow changes to the relevant outputs or delivery dates to which such outputs relate. This lack of flexibility is concerning in circumstances where, under the non-delivery PCD mechanism, companies face a claw back of their entire allowance following a failure to deliver a PCD output by the Ofwat prescribed date. This remains the case regardless of whether the company has agreed an alternative delivery date with the relevant quality regulator (e.g. the EA or DWI).

49. The position with respect to each of **outputs** and **delivery dates** is considered further below.

(i) Outputs

50. Ofwat states that PCDs are set at a "programme" level. However, the majority of PCD outputs are set at a much more granular level. By way of example, Ofwat imposes nine separate wastewater WINEP PCDs, which are linked to numerous specific WINEP actions.[26]

51. The lack of flexibility is of particular concern with respect to PCDs for which there is considerable **uncertainty as to what constitutes delivering the outputs specified in the FD**. It is also of concern with respect to PCDs that specify outputs the attainment of which is dependent on **factors beyond our control**. In both cases, the PCD framework leaves companies with a significant degree of risk which is difficult or impossible to manage.

52. These points are illustrated by two case studies provided below, respectively (i) our scheme level storm overflow PCD; and (ii) our Network and Information Systems (**NIS**) PCD.

53. Other factors of concern that arise from the PCD framework include:

[24] Gov.uk, Water industry national environment programme (WINEP) methodology, SOC-5-0018.
[25] Ofwat, February 2025, PR24 final determinations: Expenditure allowances, page 315, SOC-1-0006.
[26] For example, our Nitrogen (**N**)-removal PCD requires the delivery of 37 schemes and the meeting of a 1,819,909 P.E. target.

- **Factors outside of management control:** Exogenous factors create a material deliverability risk for companies.

  In our case, we face a number of factors outside of management control in light of the scale and complexity of our programme for AMP8. A key example of such factors is local authority planning permissions. These are required for most of our projects to be delivered during AMP8. Some local conditions require extremely complex and interdependent approvals relating to environmental impacts and nature protection. The timeline for receiving such approvals is outside of our control.

  Other examples of factors outside of management control which could impact delivery of projects include (i) granting of required permissions from national parks; (ii) necessary land acquisitions; (iii) wayleaves and easements; (iv) granting of requirement EA permit amendments; and (v) granting of abstraction licences or licence amendments.

- **Supply chain risks:** Companies will manage the majority of their PR24 enhancement programme at the programme level. However, their respective supply chains will control day-to-day management of projects.

  The increase in demand for infrastructure construction labour, combined with labour shortages, could create significant deliverability risks for companies' PR24 programmes. Labour availability is expected to become a more significant constraint as a result of an ageing labour force, the reduced attraction of construction-related professions and uncertainty regarding future immigration policies. As at January 2025, there are 2.3 vacancies per 100 employees in the UK construction sector, which is materially higher than the long-term average of 1.7.[27] This is exacerbated by the increase in scale of enhancement projects during AMP8, with an increased risk of companies competing for the same resources.

  Increasing the risk exposure of our contractors to deliver outputs in accordance with deadlines prescribed by PCDs would either be rejected by our supply chain or otherwise require a very significant risk premium, for which no allowance is made in Ofwat's cost efficiency assessment. This means that we will retain the majority of PCD risk, without having the necessary tools available to mitigate this risk.

- **Increase in scale of delivery leading to capacity constraints on materials and equipment:** The fact that companies have greatly expanded capital programmes for PR24 will result in an increase in demand and competition for available resources. This is particularly the case in areas that have specific technical and service requirements, including in respect of SEMD and NIS programmes.

  There will also be capacity constraints in other areas, which could lead to significant deliverability risk. For example, known lead times for bioresources process plants are currently up to six months longer than originally anticipated which will create a significant delivery challenge for our Bioresources programme (Industrial Emissions Directive and Cake Storage).

  In addition, on the demand side, there are a number of other large UK infrastructure programmes being delivered at the same time as AMP8 and these will also compete for resources. For example, RIIO-3, which includes the Accelerating Strategic Transmission Infrastructure programme is estimated at £99bn over the regulatory period in order to prepare the UK to meet net zero targets. Such significant programmes will create additional demand pressures on an already limited supply of labour.

[27] Office for National Statistics, January 2025, Statistical bulletin - Vacancies and jobs in the UK, page 14, SOC-5-0005.

Case Study (1): Storm Overflows – Scheme Level PCD (Equivalent Storage)

Approach in the FD

Non-delivery PCD:

- The PCD[28] tracks delivery of storm overflow investments at a scheme level using a measure of 'equivalent storage'. Ofwat defines this as the volume of storage required to meet the targets in Defra's Storm Overflow Discharge Reduction Plan (**SODRP**). The targets under SODRP include that companies will not be permitted to exceed the backstop target of an average of 10 spills per year by 2050.

  This PCD incorporates flexibility in the sense that companies have the option of delivering equivalent storage by means of grey, green or hybrid (i.e. grey/green)[29] schemes. Ofwat will also allow changes to schemes including (i) substitution between grey, green and hybrid solutions; and (ii) substitution between network schemes and WTW schemes. Ofwat will monitor the delivered equivalent storage and carry out a reconciliation if less equivalent storage is installed than funded through the FD.

  All storm overflow schemes delivered will be subject to an end of period reconciliation. Only schemes that were outliers in Ofwat's PR24 cost assessment approach and/or subject to deep dives which have been delivered without a change in scheme type and equivalent volume will not be subject to an adjustment in the allowance. All other schemes are subject to adjustment. Adjustment to scheme allowances will be such that the actual allowance will be the lower of the ex-post or ex-ante allowance. Ofwat will not undertake a deep dive assessment in-period. This principle applies for all scheme level PCDs in the FD.
- Equivalent storage will be measured using traditional storage volume (m3) and calculation methods for non-storage solutions. For non-storage solutions, the FD provides that equivalent storage will be calculated by running a hydraulic model with the solution included within the model and assessing the extent to which the storage requirement to meet the SODRP target is reduced.

Time incentive PCD:

- Ofwat adopts a common time incentive profile, which it considers is consistent with the timely delivery of storm overflow schemes following the completion of investigations between 2025-27.
- Companies must deliver a cumulative percentage of equivalent storage of (i) 5% by 2026-27; (ii) 35% by 2027-28; (iii) 60% by 2028-29; and (iv) 100% by 2029-30.

Our concerns with the FD approach

Equivalent storage metric used for non-delivery PCD:

- We support the concept of equivalent storage in principle. However, we have a number of concerns with Ofwat's approach in setting the PCD.[30]

[28] See Ofwat, February 2025, PR24 final determinations: Price control deliverables appendix, pages 61- 79, SOC-5-0011.
[29] 'Grey' storage largely comprises conventional storage solutions such as tanks or pipes. 'Green' solutions comprise a range of sustainable drainage solutions such as swales, ponds, wetlands, rain gardens, green roofs and permeable paving.
[30] In addition to PCD-related concerns set out in this case study, we also have allowance-related concerns arising from the lack of flexibility with respect to storage volumes. Total storage volumes have effectively been capped by reference to the top-down broad-brush approach we used to determine the actual storage volume required to meet the Defra targets. Given an approach was needed to be developed quickly for the 978 storm overflows, it was not possible to complete modelling for each overflow to determine the actual

- **Historical Data**: Our own Storm Overflow Action Plan (**SOAP**) (which was submitted as part of our draft PR24 Business Plan in October 2023 setting out plans for compliance with Defra's SODRP targets) was based on measured spills in 2021 and 2022. However, 2023 and 2024 were exceptionally wet years and hence the number of spills recorded for the overflows increased. This means that the spill reductions required are much more significant than the point at which we prepared our SOAP.
- **The flexibility afforded under the PCD contributes to deliverability risk**. We acknowledge that the PCD provides a level of flexibility to make substitutions between scheme designs, including to change from grey to hybrid and/or green solutions.

  However, this does not reduce uncertainty around the impact of the PCD as the **measure of equivalent storage adopted by Ofwat is untested** with respect to its application to non-storage solutions. There is no established methodology for evaluating equivalent storage for non-storage solutions such as sewer lining, surface water separation and sustainable drainage systems (**SuDs**). Ofwat has not provided detailed information to support its calculation of equivalent storage, particularly in respect of how the proposed hydraulic model should be applied to various non-storage solutions.
- The complexities in measuring equivalent storage provided in order to set the ex-post allowance, especially where a fit for purpose methodology is unavailable, will result in an **incentive to prioritise grey end of pipe storage solutions at treatment works** in order to reduce deliverability risk. This is notwithstanding that we want to deliver green solutions to better manage rainwater in the urban environment and support communities to adapt to climate change and increase resilience.

  We have, however, already assessed that our sites will require hybrid solutions. This is on the basis that grey storage tank solutions at WTWs will be insufficient to resolve overflows and achieve the Defra spill targets. The development of hybrid solutions will require (i) significant stakeholder and customer engagement; (ii) the purchase of land; (iii) modifications to existing wastewater and drainage systems; and (iv) potential works on private land and privately owned drainage infrastructure.

  This will result in significant costs to ensure that we provide the best value solution for customers that will satisfy SODRP targets for the next 25 years. The measurements and modelling required to demonstrate equivalent storage delivered for Ofwat's metric will also increase costs considerably. This issue is exacerbated by current staffing shortages for hydraulic modellers in the sector.

Time incentive PCD:

- We consider that it is inappropriate and impractical to impose an in-AMP delivery profile for the incremental delivery of equivalent storage. Companies are already required to comply with output-based delivery profiles, which are set under EA WINEP requirements. We have clear regulatory targets to deliver spill reductions at 54 overflows by June 2027. These set the early delivery targets for spills reduction. We will seek to deliver these targets as quickly as possible to hit this delivery date. We consider that the overlay of additional in-AMP delivery targets under the PCD framework. could hinder

spill volume required. We are now required to complete this modelling to provide evidence to Ofwat for the outturn equivalent storage. The equivalent storage expected to tackle current weather events, and to allow the solutions to remain effective over the next 25 years in line with SODRP targets, is much greater than we estimated at the time of our SOAP submission. But the total allowance is capped at the volume estimated in our business plan. This means that we are unable to use funding at a wider programme level to ensure delivery of outcome-based deliverables in line with SODRP spill targets. There is significant uncertainty in delivering a solution which must be effective for 25 years. Climate change and growth were not factored into the development of our SOAP. This was as a result of tight restrictions on the timeline to produce a plan for all 978 storm overflows we faced in 2020/21. The calculation of the equivalent storage that is required and the performance of storm overflows are both highly weather sensitive. Assumptions and predictions can be made for climate change. However, the actual weather patterns experienced may result in more spills on average over a ten year period than predicted by climate models. As set out in Chapter 4 (Treatment of Uncertainty Through Mechanisms), we request that the CMA alters the delivery mechanism address uncertainties related to the storm overflows programme.

companies' ability to deliver the overall outputs required by the end of the PCD delivery period to avoid clawback of the allowance.

Case Study (2): Cyber (NIS) PCD

Approach in the FD

- Subsequent to the DD, Ofwat introduced a specific PCD in respect of Southern Water's programme for satisfying our obligations under the Network Information Systems (**NIS**) Regulations 2018 (the **NIS Regulations**). For the water sector, the NIS Regulations are accompanied by additional requirements under the Cyber Assessment Framework and DWI Sector Specific Profile.
- The relevant PCD output is based on the delivery of confirmation from the DWI that the relevant legal instrument has been completed to the DWI's satisfaction. [redacted]

Our concerns with the FD approach

- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]

[31] Ofwat, PR24CA109 Water Resilience and Security PCDs [Extract], SOC-5-0022.

[redacted]

- There is also wider regulatory and legal uncertainty regarding our NIS obligations. In AMP7, the DWI made changes to the level of compliance expected to be achieved under the NIS Regulations. The National Cyber Security Centre also updated the Cyber Assessment Framework several times during AMP7, with a further version to be implemented in 2025/26. In terms of uncertainty in AMP8, it is, for example, unclear how the proposed Cyber Security and Resilience Bill (which is set to be introduced to Parliament in 2025) will impact the NIS Regulation. [redacted]
- We note that the PCD framework in the FD does not provide any flexibility to implement changes agreed with the DWI in respect of what is required to satisfy Southern Water' obligations under the NIS Regulations.

(ii) Delivery Dates

54. In addition to the inflexibility of outputs, the PCD framework is also overly restrictive and punitive in imposing delivery dates for PCDs. As set out at paragraph 21, the deadline for delivering outputs under the PCD framework is generally the end of AMP8, except in the case of PCDs relating to DWI requirements where Ofwat will assess delivery of the relevant PCD beyond AMP8. The deadlines for delivering overall projects under our statutory and other regulatory obligations broadly align with the delivery dates for providing overall PCD outputs.

55. There may in a particular case be scope for companies to request and agree changes to the deadlines for delivery of statutory and other regulatory requirements with the relevant quality regulators (e.g. the EA or DWI). But changes to the delivery date under the PCD framework are not possible under the mechanism established by the FD. As a consequence, we could face a claw-back of allowances for non-delivery of a PCD output, notwithstanding that the statutory deadline delivery of the same output has been extended, and that deadline complied with. Ofwat's ability to remove funding for statutory schemes without sufficient flexibility to amend PCD outputs reduces regulatory certainty and conflicts with Ofwat's duty to secure that companies can finance their statutory duties.

2.4. Relevant regulatory precedent: Ofgem's approach to PCDs

56. As stated at paragraph 7 above, Ofwat initially proposed the introduction of PCDs with a view to following the approach of Ofgem, which first introduced a PCD framework as part of its RIIO-2 price controls.

57. In its PR24 Draft Methodology, Ofwat referenced the 'evaluative' PCDs introduced by Ofgem, noting that such PCDs "*are set in cases where there is some flexibility in how the output can be delivered to allow companies to explore innovative delivery approaches*".[32]

58. Despite being the inspiration for Ofwat's own PCD framework, Ofwat has not carried across any of the following flexible aspects of Ofgem's RIIO-2 PCD framework,[33] particularly with respect to evaluative PCDs:

- **Retainment of efficiently incurred costs for non-delivery or deferment of evaluative PCDs:** Where a licensee fails to deliver or otherwise defers a PCD beyond the regulatory period, Ofgem will adjust allowances downwards to the level of efficient costs, as demonstrated by the licensee, prior to the cancellation or deferment decision. The assessment of efficiency and necessary costs is considered by Ofgem on a case-by-case basis. Unlike Ofwat's approach, the retainment of such costs is not subject to fixed percentage or materiality threshold.
- **No automatic adjustment for delayed or partially delivered evaluative PCDs:** In respect of delayed evaluative PCDs, Ofgem may withhold an adjustment of allowances for a delay in the delivery of an evaluative PCD, unless it considers that the delay results in a material impact on customer outcomes. In respect of partially delivered evaluative PCDs, Ofgem will reduce allowances unless the licensee can demonstrate that any associated cost savings on the partially delivered PCD are the result of efficiency or innovation, and that the consumer outcome delivered is better than would have been delivered from the output originally specified in the PCD.
- **Flexibility of outcomes**: In respect of evaluative PCDs, Ofgem allows for alternative specifications to be delivered with no claw-back of allowances, provided that they deliver the same or greater consumer outcomes as the original specifications.

59. Ofgem has also proposed further flexible measures to the PCD framework at RIIO-3. In its July 2024 Methodology Decision, Ofgem set out that in order to "*continue to encourage delivery while enabling flexibility*" it will adjust evaluative PCD allowances upwards where there is an overspend due to changes in scope that "*deliver benefits to consumers*" and "*can be demonstrated to have been efficiently incurred*."[34]

60. Ofgem's approach to the PCD framework demonstrates that it is possible to allow flexibility in delivery while ensuring that consumers benefit from outputs delivered. This further highlights the inflexibility of Ofwat's approach.

3. Error 2: The design of the PCD framework creates a significant RoRE downside skew on both notional company and 'Southern Water-like' notional company bases

3.1. Overview

61. As set out in Error 1 above, the punitive and inflexible design of the PCD framework introduces significant deliverability risk, including the risk of clawbacks for partially delivered projects. As evidenced below, this creates a significant RoRE downside skew on a notional company basis and, even more significantly, on a Southern Water-like notional company.

[32] Ofwat, May 2021, PR24 and beyond: Creating tomorrow, together, page 90, SOC-5-0006.
[33] Ofgem, August 2023, Price Control Deliverable Reporting Requirements and Methodology Document: Version 4, SOC-5-0020.
[34] Ofgem, July 2024, RIIO-3 Sector Specific Methodology Decision – Overview Document, para 6.14, SOC-5-0007.

62. As set out below, and explained in Chapter 1 (Risk and Financeability), Ofwat has also failed to take account of the characteristics of companies' AMP8 programmes. This leads to an overstatement of the proportion of projects that will be delivered on time under the PCD framework, and leads to an understatement of the time incentive PCD risk.

3.2. Notional company RoRE risk from PCDs

63. A full substantive assessment of the downside risk for a notionally efficient company is provided in the KPMG report *PR24 Final Determinations – risk analysis for a notional company*. However, the key points regarding the impact of PCDs on the risk to a notional company are summarised in this section.

64. The design risk of PCDs and other regulatory incentive mechanisms (including ODIs) are not reflected fully in Ofwat's risk ranges in the FD. The FD risk methodology for wholesale totex did consider risk for time incentive PCDs (based on WINEP delivery for 2020 – 2025). However, the FD omitted non-delivery PCD risk entirely, concluding that there is no scope for clawbacks to occur on partially delivered projects. In reality, non-delivery PCDs cause exposure to asymmetric risk of late project delivery under non-delivery PCDs. This is because these PCDs are designed to claw back an allowance if delivery is delayed into the next AMP by more than a few months.

65. The PCD risk is compounded by the Delayed Delivery Cashflow Mechanism (**DDCM**) which Ofwat maintains in the FD. Ofwat has claimed that there is no overlap between the DDCM and PCD mechanisms on the basis that the cost reconciliation mechanism will reverse the impact of the DDCM before applying cost sharing and PCDs. However, for the impact to be reversed, the delivery scope of the PCD would also need to be revised downward to reflect decreased allowances to truly avoid any double counting. Ofwat does not comment on this element of duplication. Based on KPMG's risk analysis, for a notional WaSC, the PCD framework would lead to a RoRE downside skew on enhancement totex as set out in Table 1:

Table 1: Enhancement totex RoRE risk % for a notional WaSC arising from PCDs

Notional WaSC	P10	P50	P90
Non-delivery PCDs	-0.83%	-0.25%	-0.04%
Time incentive PCDs	-0.22%	-0.08%	-0.06%
Total simulated PCD risk	-1.05%	-0.33%	-0.1%

66. Enhancement totex presents a key risk for both notional WaSCs and notional WoCs due to the unprecedented size and complexity of the AMP8 capital programme compared to previous price controls. The FD provides higher allowances for enhancement compared with the DD. However, higher allowances provided in the FD do not fully mitigate the cost performance risk associated with large and complex programmes. Cost performance risk inherent in construction projects in the infrastructure sector is driven by scope change, design change, input price changes and ex-ante budget mis-forecasting risk.

67. The risk relating to PCDs remains a key driver of a negative base-case RoRE even if cost allowances are assumed to be appropriately calibrated.[35] Non-delivery PCDs are inherently asymmetric as there is no possibility of outperformance and they present a material risk for the notional company should it fail to deliver part of the programme. A delivery buffer of a "few months

[35] The total enhancement risk represents the total risk across cost performance and PCDs aggregated through Monte Carlo simulation. The total risk simulated is not equal to the some of the individual risks. This would only hold true where correlations are assumed to be 1. In reality, whilst delays and cost overruns often occur in unison, they can also occur independently: one does not necessarily imply the other.

from the start of AMP9" is provided before clawbacks apply, however the regulatory discretion leaves residual risk for companies as it is unclear whether Ofwat would disallow a clawback. Ofwat omitted the risk relating to non-deliverable PCDs from its RoRE ranges in FD.

68. Simulated PCD risk for a notional WaSC is more severe than that for a notional WoC due to WINEP Environment wastewater schemes being very large and almost entirely protected by PCDs. The scale of the wastewater WINEP programme is far greater than the water WINEP therefore WoCs have a much smaller risk exposure on WINEP relative to WaSCs.

3.3. RoRE risk from PCDs for the 'Southern Water-like' notional company

69. The size and shape of a 'Southern Water-like' notional company's programme will amplify the RoRE downside skewed risk even further for the reasons explained in this section. When the real-world project data is applied to the actual company with the level of complication in Southern Water's programme, PCDs alone would lead to a RoRE downside skew of -0.35% at the P50 basis, between -1.12% and 0.02% at P10, P90 bases, as set out at Table 2.[36]

Table 2: Enhancement totex RoRE risk % for a 'Southern Water-like' notional WaSC arising from PCDs

SRN-like notional WaSC	P10	P50	P90
Non-delivery PCDs	-0.92%	-0.28%	-0.04%
Time incentive PCDs	-0.20%	-0.07%	0.06%
Total PCD risk	-1.12%	-0.35%	-0.02%

70. The scale and step up in capital intensity is compounded by the greater complexity in our programme compared to other companies. In particular, and as we set out below:

- **Characteristics of our region:** We face significant exposure to ecological characteristics which make operating and delivering projects more challenging compared with other areas in the countries, and necessitate the delivery of novel and complex schemes in AMP8.
- **WINEP programme:** Ecological factors mean a company in our region will have a WINEP programme, which includes novel schemes, particularly on storm overflows and wastewater treatment.
- **WRMP programme:** Significant drought pressure and a higher proportion of protected ecosystems in the South East region creates a significant supply demand balance deficit. A greater number of technically complex solutions are required to meet this deficit.

Characteristics of our region

- Our region has exposure to ecological characteristics which make operating and delivering infrastructure projects more challenging compared with other areas of the country. These include a range of protected wildlife habitats like chalk streams and shellfish waters, as well as other designated zones like bathing waters and Areas of Outstanding Natural Beauty. These factors necessitate novel and complex schemes in AMP8.

- Our region has one of the largest exposures to shellfish waters in the industry, which are protected areas designated under the WFD to protect shellfish growth and contribute to a high-quality product for human consumption. This presents a significant challenge due to the complex interplay of factors, including:
  - the delicate nature of the shellfish ecosystem;
  - the presence of dense urban populations near these waters, such as Southampton and Portsmouth;
  - heightened public scrutiny; and
  - challenging regulatory deadlines.[37]

WINEP programme

- The WINEP programme of a notional company similar to Southern Water will be more technically complex than other companies because of the novelty of schemes particularly on storm overflows and wastewater treatment as a result of the characteristics in the region.
- For example, we have the greatest number of Nitrogen (**N**)-removal schemes due to the significant pressure on coastal and estuarine waters in its region. Under the Levelling Up and Regeneration Act 2023 (**LURA**), WTWs in nutrient-sensitive areas must meet Technically Achievable Limits (**TAL**) for nutrient discharges by 2030. Southern Water faces a disproportionate burden under LURA, with the highest number of nutrient-significant sites (37) compared to other water companies (Anglian Water has 18 N-removal schemes, and Wessex Water has 8).
- N-removal schemes are more technically demanding than P-removal schemes. The complex biological process involved requires significant capital infrastructure and precise operational control. N-removal relies on a two-step process[38] dependent on bacteria sensitive to temperature and pH, necessitating advanced control and accurate methanol dosing.[39] Insufficient methanol leads to incomplete denitrification, while excess dosing increases costs and may cause environmental harm.[40] In contrast, P-removal uses a simpler, one-step precipitation process based on a predictable chemical reaction.[41] It can be easily added to existing treatment processes and the treatment process does not require biological activity. It is therefore comparatively easier to control than N-removal.
- N-removal technologies are newer relative to chemical P-removal. P-removal using traditional activated sludge processes and chemical removal has been widely used for circa. 80 years. While conventional N-removal became widely adopted in the 1990s these have large footprints and high resource demands. Since the mid-2000s challenges such as limited space, climate considerations, and stringent discharge limits have driven the development of novel N-removal technologies such as granular activated sludge. These advanced systems are necessary to meet TAL (10 mg/L Total N) as required under the LURA.

[37] The EA WINEP guidance on shellfish waters sets out the need for action under the WFD to prevent deterioration of shellfish waters by 2027 and to deliver improvements by 2030. Our October 2023 business plan submission proposed an extended delivery timeframe, due to the complexity of shellfish upgrades, but was rejected by the EA. A major requirement from the EA was the need to bring forward 24 overflows discharging to Portsmouth and Langstone Harbour shellfish waters from AMP9 into AMP8. The EA requires all 39 overflows in Portsmouth Harbour to have a completion date of June 2027, and the 8 overflows in Langstone Harbour to be completed by March 2030. Southern Water, August 2024, SRN-DDR-044: WINEP – Storm Overflows Enhancement Cost Evidence Case, SOC-5-0019.
[24] The first step (NH^3 to NO_3^-) is called nitrification and requires aerobic conditions. The second step (NO_3^- to N^2) is called denitrification and requires anoxic conditions.
[39] Methanol dosing is not commonly applied at wastewater treatment works. According to Defra's data, of the 9,000 wastewater treatment works in the UK, there are 35 of them with total N permits reported against the Urban Wastewater Treatment Regulations. We operate 10 of them, 19 are operated by Anglian Water, 4 by South West Water, 1 by Wessex Water, and 1 by Severn Trent Water. 2 This indicates that we are one of few companies experienced in delivering N-removal schemes. Southern Water, August 2024, SRN-DDR-043: WINEP Nutrients Phosphorus (P) and Nitrogen (N) Schemes, SOC-5-0008.
[40] Excessive methanol dosing can negatively affect environmental water quality by increasing oxygen demand, forming toxic byproducts, creating microbial imbalances, and contributing to carbon loading,
[41] When metal salts are added to wastewater, they immediately bind with the phosphate ions, forming insoluble metal phosphates that can be easily removed by physical separation.

WRMP programme

- Our WRMP baseline forecasts the greatest supply demand balance deficit (before any interventions) in the sector. We have the largest forecast long-term water deficit in the sector. This is as a result of significant drought pressure in the South East region and because we have a high proportion of protected ecosystems, e.g. chalk streams like the River Test and Itchen. Our WRMP programme aims to meet this deficit but this requires a greater number of more technically complex solutions such as water reuse and desalination than the sector-average.
- As a result of this deficit, we are planning to deliver water recycling (reuse) water supply schemes. Water recycling is relatively novel in the UK and there is an elevated level of stakeholder interest in these types of schemes. As the first water company in the UK to pursue planning permission for such schemes, we are navigating a complex stakeholder consultation. In response to DD representations from stakeholders including the public, MPs, local councils, and environmental groups, Ofwat's FD emphasises the need for "extensive engagement" to build community confidence.[42] Enhanced engagement further complicates the already challenging task of delivering these novel and substantial investments.
- We are planning to deliver 5 (including 1 SRO) water reuse schemes in AMP8. This has no comparison in the sector, with Anglian as the only other company with a single reuse scheme planned in AMP8. The 5 schemes are:
  - **Sandown:** Replace the water we are abstracting by replacing it with treated effluent from our WTWs to supplement flows in the Eastern River Yar, so there's more water available further downstream.
  - **Sittingbourne**: Supply treated effluent to an industrial customer, allowing us to take over their abstraction license.
  - **Ford:** Recycle treated effluent from our Ford WTWs to the River Western Rother to replace water abstracted from the river during periods of drought.
  - **Aylesford:** Reduce the amount of water we take from the River Medway during drought periods by recycling treated effluent from our Aylesford wastewater treatment works.
  - **Havant Thicket (SRO):** Recycle treated effluent from our Budd's Farm wastewater treatment works via a new Havant Thicket Reservoir which feeds the [redacted]

71. We face a unique set of challenges in delivering our complex and ambitious AMP8 investment programme. This is driven by the high capital intensity, complex technical nature of many of our projects and the environmental sensitivity of our region. The PCD framework in its current form fails to adequately account for the inherent complexities and uncertainties associated with delivering large-scale infrastructure programmes. The design of the PCD framework coupled with the unique circumstances of operating in our region, exacerbates the RoRE downside skew.

3.4. Ofwat uses out dated programme data to assess the time incentive PCD risk

72. As we set out in Chapter 1 (Risk and Financeability), Ofwat has calculated the risk associated from time incentive PCDs using delivery statistics of the PR19 programme, which was also used to calibrate the mechanism's 3:1 penalty:reward ratio.

73. Using PR19 WINEP and WRMP data to set the penalty:reward ratio and assess the risk results in an excessive relative penalty and an understatement of the time incentive PCD risk. The penalty

[42] Ofwat, February 2025, Gate three final decision for [redacted] Hampshire Water Transfer and Water Recycling Project, page 17, SOC-5-0009.

rate was based on Ofwat's assessment that projects are delivered on time 75% of the time, creating a ratio of 75:25 or 3:1 between penalty on late projects and reward for timely delivery.

74. However, many of the AMP7 WINEP schemes are low complexity and relate to short duration projects. For example, within the WINEP programme, schemes included installing monitors at WTWs (42% of schemes) and investigations into the presence of monitors at WTWs (17% of schemes). The sample is not representative of the significantly more complex AMP8 enhancement programme.

75. As set out in KPMG's *PR24 Final Determinations – risk analysis for a notional company* Report, KPMG has conducted analysis based on projects within their infrastructure database, which most closely reflect the characteristics of the AMP8 capital programme. The infrastructure database demonstrates that 60% of capital projects are delivered on time.[43] Using Ofwat's methodology, this would form a ratio of 60:40 or 3:2 – an increase in the reward rate versus Ofwat's calculation.

4. Error 3: Ofwat's imposition of PCDs on base expenditure is contradictory to its outcomes and totex framework and creates perverse incentives

4.1. Overview

76. In its PR24 Final Methodology, Ofwat stated an intention to use PCDs to "*protect customers against potential non- or partial delivery of PR24 enhancement schemes*".[44] Despite this initial focus on enhancement, the FD additionally provides for PCDs on base expenditure for mains renewal and network reinforcement.

77. Ofwat introduced the concept of base PCDs for the first time in the DD which gave no opportunity for consultation on this mechanism. At the DD Response phase the majority of companies provided representations on the approach and concept of base PCDs. The FD did not directly address any of the concerns raised by companies.

78. We have the following overarching concerns with the use of PCDs on base expenditure:

- **Base expenditure PCDs are not in line with regulatory precedent:** As stated at Error 1, PCDs reduce flexibility for companies if they are to avoid non-delivery PCDs and/or time incentive PCDs. The imposition of PCDs on base expenditure essentially ring-fences proportions of companies' botex allowances for specific activities at specific unit rates. This represents a marked change from Ofwat's longstanding approach to allowing companies' flexibility in the use and delivery of base expenditure[45] – an approach that was not signalled through Ofwat's PR24 methodology consultations.
- **PCDs impact non-PCD botex allowances:** The ring-fencing effectively reduces the remaining non-PCD botex allowance, reducing companies' scope to redirect expenditure to most effectively to deliver outcomes and benefits. The reduction in flexibility from the imposition of PCDs on base expenditure undermines a central element of the outcomes and totex framework, to the ultimate detriment of consumers and the environment. Additionally,

[43] KPMG, January 2025, PR24 Final Determinations – risk analysis for a notional company, page 49, SOC-1-0001.
[44] Ofwat, December 2022, Creating tomorrow, together: Our final methodology for PR24 - Appendix 9 Setting expenditure allowances, page 45, SOC-5-0003.
[45] Ofwat introduced an outcomes and totex framework at PR14 aimed at incentivising companies to deliver customer and environmental outcomes in the most efficient way possible. This framework was designed to be agnostic to the specific activities and types of expenditure used to deliver those outcomes. It provides companies with the incentives and flexibility to identify innovative and efficient ways to deliver outcomes.

the remaining 'flexible' base allowances are significantly lower than we require to sustainably run the water business: they are lower than our allowance at PR19 (see Chapter 2 (Botex)).

- **Base expenditure PCDs do not align with how botex allowances are set:** Ofwat sets botex allowances using top-down modelling assessments and specific cost adjustments. Unlike for enhancement, botex allowances are not linked to specific activities or schemes. Rather, they are intended to fund the high-level outcomes to "provide a base level of service to customers" [46].
- **Base PCDs were not subject to consultation during the PR24 methodology phase:** this deprived companies of the opportunity to respond and provide input before their implementation in the DD. Imposing base PCDs contradicts Ofwat's own statements made in the PR24 Final Methodology including, *"PCDs will allow enhancement funding to be returned to customers in the event of under- or non-delivery of outputs or outcomes associated with enhancement expenditure."*[47] Failing to consult on such a fundamental change to the price review framework, particularly one involving the clawback of 'core' (i.e. without any cost adjustment uplift) base allowances, is a departure from regulatory best practice.

4.2. Concerns with base Mains Renewal PCD

79. The FD applies PCDs in respect of three sub-categories of mains renewal in respect of our base expenditure, namely:

- **Base wholesale water model funded renewals**: length of mains funded through modelled base allowances;
- **Asset health base adjustment renewals**: length of mains replaced through base cost adjustments; and
- **Enhancement leakage and water quality renewals**: length of mains renewed through enhancement allowance.

80. The approach taken by Ofwat to address asset health investment in the FD is inconsistent across asset classes and tries to simplify a solution to investment in maintaining the water network. Ofwat justify the base PCD on mains renewals because *"the sector is underdelivering against its PR19 business plan proposals, reaching average renewal rates of just 0.1% per year against a plan of 0.4% per year."*[48] (see Chapter 3 Enhancements Expenditure Allowances).

81. Setting a PCD on base model funded renewals is contradictory both to Ofwat's top-down approach to setting botex and to the outcomes framework.

82. Botex allowances do not fund specific activities or levels of activity, but the high-level outcomes to "*provide a base level of service to customers*".[49] Ofwat erroneously extrapolated historical levels of mains renewals activities for some companies to determine an implicit allowance for botex for those mains renewals activities for all companies. Ofwat is wrong to assume the historical average from 2011 to 2023 is the single and only appropriate method for estimating what length of mains renewals base buys: see Chapter 3 (Enhancement Expenditure Allowances) for an explanation of why this is wrong.

83. Ofwat has set a PCD for model funded base mains renewals but has not specified to the same extent PCDs for the replacement of any other asset classes from base expenditure that support asset health. Focusing on a narrow asset class is likely to create perverse incentives and unintended risks for the sector on other asset classes. By undermining incentives for companies to manage their wider portfolio risks, the PCD-focused asset renewals approach may contribute to

[46] Ofwat, February 2025, PR24 final determinations: Expenditure allowances, page 18, SOC-1-0006.
[47] Ofwat, December 2022, Creating tomorrow, together: our final methodology for PR24, page 90, SOC-5-0021.
[48] See Ofwat, February 2025, PR24 final determinations: Price control deliverables appendix, page 20, SOC-5-0011.
[49] Ofwat, February 2025, PR24 final determinations: Expenditure allowances, page 18, SOC-1-0006.

underinvestment in other areas of water networks, such as pumping stations and reservoirs, where Ofwat has not prescribed PCDs.

84. Ofwat has incentivised companies to maintain their mains asset health using the mains bursts and mains repairs PCs and ODIs throughout AMP6 and AMP7 respectively. Ofwat have not provided any justification throughout PR24 for why the mains repairs ODIs is inadequate to maintain the correct level of asset health for water mains assets.

4.3. Concerns with base Network Reinforcement PCD

85. The PR24 Final Methodology confirmed that it would include network reinforcement costs in the base cost models due to substantial interactions with capital maintenance expenditure and a close relationship with base cost drivers (e.g. scale and density), and that it would consider cost adjustment claims from companies that expect to deliver a higher amount of network reinforcement than is funded through base cost models.[50]

(i) Our approach in response to the DD

86. In the DD Response, we submitted a cost adjustment claim to Ofwat for wastewater growth network reinforcement[51] (we did not submit a CAC for water network reinforcement). Our CAC requested an uplift of £49.8m.

Table 3: Value of cost adjustment claim for wastewater network reinforcement

Description	Value
Total gross value of claim for AMP8	£62.3m
Total implicit value of claim for AMP8	£12.5m
Total net value of claim for AMP8	£49.8m

87. We calculated our implicit allowance using an average approach between four different methods, consistent with the approach that Thames Water used to calculate its wastewater growth network reinforcement implicit allowance.

Table 4: Results for different methods of calculating the implicit allowance for wastewater networks reinforcement

Wastewater – Network reinforcement implicit allowance	£m
1. Using Econometric Improved Models PR24	8.729
2. Extrapolating Moving average of Actual Expenditure with efficiency Challenge	9.665
3. Industry Historical Expenditure Avg. Proportion to AMP8 Model efficiency allowance	20.006
4. Median (Unit Cost)	11.658
Average of 4 methods	**12.515**

[50] Ofwat, December 2022, Creating tomorrow, together: Our final methodology for PR24 - Appendix 9 Setting expenditure allowances, page 14, SOC-5-0003.
[51] Southern Water, August 2024, SRN-DDR-017: Wastewater Growth Network Reinforcement Cost Adjustment Claim, SOC-5-0010.

(ii) Ofwat's approach in the FD

88. Ofwat accepted the need for the cost adjustment and the FD provided a sector wide cost adjustment for both wastewater and water network reinforcement.

89. As an input to calculating companies' cost adjustments, Ofwat estimated the implicit allowance using the average of two methods:

- Company average network reinforcement spend over last five years of outturn.
- Industry average network reinforcement spend over 2011-12 to 2023-24.

90. Ofwat calculated the implicit allowance of £37.2m for our wastewater network reinforcement and £3.8m for water network reinforcement. Following an efficiency challenge (not considered further here), Ofwat provided a cost adjustment of +£24.1m for wastewater and +£21.7m for water network reinforcement. The FD then included a PCD covering the full amount of expenditure (for the implicit allowance and the cost adjustment) for both wastewater (£60m) and water (£25m) network reinforcement (post frontier shift).

91. Ofwat have requested that companies submit named network reinforcement schemes they plan to deliver to Ofwat by 31 March 2025.

(iii) Our concerns with the FD approach

92. Southern Water and Ofwat calculated wastewater network reinforcement implicit allowances using different approaches. The FD recognised that "*there is no perfect approach to estimating the implicit allowance".*[52] As such there should not be any PCD applied to base, particularly where the PCD is attached to an imperfect assessment the implicit allowance – this is not good regulatory practice.

93. This also highlights the contradiction within the regulatory framework in trying to both set top-down modelled allowance for botex and ring-fencing specific base activities through a bottom-up approach.

94. We agree that there should be customer protection for additional material enhancement or cost adjustments, but any PCD non-delivery penalty clawback should align to and not exceed any cost adjustment uplift (i.e. excluding Ofwat's imperfect assessment of the implicit allowance).

5. Error 4: The outputs-focussed PCD framework conflicts with the existing outcomes-based regulatory approach and is detrimental to consumer outcomes

95. In the FD, the design of the PCD framework conflicts with the aims of the existing outcomes-based regulatory approach adopted by Ofwat. This step-change is detrimental to consumer outcomes by discouraging efficiency and innovation.

[52] Ofwat, February 2025, PR24 final determinations: Expenditure allowances, page 61, SOC-1-0006.

5.1. The outputs-focussed PCD framework conflicts with the existing outcomes-based regulatory approach

96. Prior to PR24, incentive mechanisms adopted by Ofwat have focussed on outcome, rather than output-based deliverables. The outcome-based regulatory framework was introduced at PR14, which amended the previous output-based price control regime. Ofwat explained that the vision for PR14 was to "*focus on companies delivering the outcomes that customers and society want and can afford*".[53] Ofwat introduced greater outcome-based flexibility through the following measures:

- **Performance Commitments (PCs) and Outcome Delivery Incentives (ODIs):** Ofwat introduced PCs with associated ODIs which, in general, provide for financial penalties (or rewards) for under (or out) performance relative to specified Performance Commitment Levels ("**PCLs**"). We explain operations of PCs and ODIs in more detail in Chapter 6 (Price Control Deliverables and Outcome Delivery Incentives). In summary, at PR24, ODI payments are based on the marginal benefit to customers from the under or over delivery of specified outcomes.

- **Totex incentive mechanism:** Ofwat set the regime on a totex basis, which prior to PR14 was set on separate opex and capex bases. Removing this distinction allowed companies to develop innovative and efficient solutions for customers, without regard to whether a particular solution was a capex or opex-driven solution. The totex incentive mechanism imposes cost-sharing relative to each company's allowances between itself and its customers.

97. The existing outcome-based price control framework gives companies the flexibility to deliver the best outcomes for customers, with the ability to:

- deliver the lowest cost and/or innovative solutions which are in customers' interests;
- re-prioritise or adapt schemes, including non-delivery of certain outputs, to achieve a better outcome for customers; and
- adapt the delivery schedules to ensure that the most efficient outcome is delivered to customers.

98. The PCD framework in the FD is a marked change from the established outcome-based approach. The output-based PCD framework restricts companies to pre-established delivery schedules, without the flexibility to innovate and deliver outcomes to customers in the most efficient manner.

99. Indeed, Ofwat recognised in its PR24 Final Methodology that *"while PCDs could limit the flexibility a company has [to] adapt its investment programme, it is important that customers are protected from non-delivery.*[54] We do not challenge the principle that companies should return to customers allowances for projects which they have not delivered and will not deliver. However, Ofwat's PCD framework goes beyond that in a manner that is detrimental to consumer outcomes.

5.2. The inflexible and punitive PCD framework is detrimental to consumer outcomes

[53] Ofwat, December 2014, Setting price controls for 2015-20 Final price control determination notice: policy chapter A2 – outcomes, page 10, SOC-6-0008.

[54] Ofwat, December 2022, Creating tomorrow, together: Our final methodology for PR24 - Appendix 9 Setting expenditure allowances, page 121, SOC-5-0003.

(i) The PCD framework discourages efficiency

100. We have explained above in the context of Error 1 and Error 2 that the complex and punitive PCD framework creates a significant downside regulatory risk.

101. The excessively punitive design of the non-delivery PCD mechanism takes no account of work completed prior to the relevant delivery date (typically the end of AMP8) or the complexity of the programme as a whole. In order to avoid the risk of facing clawbacks of allowances for delayed projects where we have incurred significant costs, we would be incentivised to complete more advanced projects in our programme in order to guarantee delivery of PCD outputs by the delivery date.

102. This could be at the expense of progressing new or early stage projects in our programme whether there is greater deliverability risk, despite the fact the most efficient course of action is to start more projects, which could face immaterial delays in delivery.

103. The PCD framework could also create the perverse incentive to overspend inefficiently in order to meet the prescribed PCD delivery date. Under the framework, a failure to deliver the required outputs by the prescribed delivery date results in a clawback of the allowance. Where there has been overspend on the relevant underdelivered scheme which falls under the enhancement overspend mechanism, 60% of the overspend will be funded by customers.

104. As a result of this mechanism, there is a perverse incentive for companies to spend considerably more on the delivery of a project that is running late, in order to avoid the late delivery and the PCD penalty. This is a particular risk for PCDs for which delivery is based on satisfaction of a single output, as shown by the following example:

- Scenario A: The company delivers the scheme late, but efficiently, at the allowed cost of £100 million. As such, a non-delivery PCD penalty would be triggered, resulting in a clawback of the entire £100 million allowance. Under the cost sharing mechanism, customers would fund £60 million and the company would fund £40 million.
- Scenario B: The company delivers the scheme on time but inefficiently at a cost of £200 million. As it is delivered on time, no non-delivery PCD penalty is triggered. However, under the cost sharing mechanism, customers would continue to fund £60 million of the overspend (as well as the £100 allowance) and the company would fund £40 million.

105. These scenarios demonstrate that PCDs may create a perverse incentive for the company to spend up to 100% more on a project that is running late in order to avoid the non-delivery PCD penalty. This is not in the interests of customers.

(ii) The PCD framework discourages innovation

106. As we have already set out in Error 1, the FD provides very limited opportunities to make changes to the granular outputs of PCDs, with no general mechanism to agree changes with Ofwat to the design of PCDs. This is notwithstanding the fact that factors beyond the companies' control could impact the deliverability of PCD outputs.

107. A further significant limitation of the design of the PCD framework is that it prevents companies from embracing innovative solutions. This is because the companies will be unable, whether on an ex-ante/within-AMP basis or through an ex-post assessment, to modify PCD outputs by evidencing to Ofwat that alternative outputs deliver the same or greater consumer benefits.

108. The current framework provides very limited opportunities for companies to amend the delivery of their programme under the PCD framework, even where a new or more cost-beneficial solution to what is prescribed under the PCD framework could be delivered. For example, we may identify an

alternative lower cost solution which achieves equivalent outcomes for customers. This may require a different delivery profile than that set under the corresponding PCD outputs. There is currently no mechanism under the PCD framework, which allows such beneficial changes.

109. This limitation on the ability to make changes to PCD outputs could mean that we are disincentivised to approach Ofwat with proposals to revise plans for the benefit of customers. Instead, we would fulfil the original plan to avoid claw-back under the PCD, thereby discouraging innovation.

5.3. The PCD framework creates an unnecessary regulatory and administrative burden for the companies and Ofwat

110. The FD fails to adequately consider the bureaucratic costs from reporting obligations under the PCD framework to both the companies and Ofwat. Its approach to the reporting procedure is overly complex and burdensome as compared to the reporting requirements under Ofgem's PCD framework.

111. Under the PCD reporting requirements provided in the FD, all companies must submit a delivery plan progress report on a six-monthly basis to demonstrate progress made again companies' delivery plan targets. These targets must be published in July 2025 via an independently third-party assured delivery plan. Ofwat will provide feedback to the companies on six-monthly report, to be submitted in April/May against the reporting delivery plan ahead of companies' requirement to produce and publish an independently assured version of the report in July of the relevant year.

112. In contrast, Ofgem requires that licensees report on the delivery progress of all PCDs on only an annual basis via a high-level report in the first instance (which may require a further full report where the licensee has not adequately demonstrated on-time delivery). In the event of delayed delivery of an evaluative PCD, licensees must submit a more extensive report, as well as an additional high-level report following full or partial completion of the relevant PCD.

113. Ofwat will consider "*after the initial years*" of the period whether six-monthly reporting is still required for companies showing good delivery progress.[55] However, it will also retain discretion to impose "*more intensive engagement and monitoring*" where a company is "*sufficiently off-track with deliverables*".[56] There is no similar intervention under Ofgem's regime.

114. In addition to these more burdensome reporting requirements under Ofwat's PCD framework, it is also the case that, unlike energy network licensees, water companies are also more likely to face existing reporting requirements from other regulators including the EA and DWI in respect of similar information required by Ofwat under the PCD framework.

115. This is despite the fact that, unlike Ofgem, Ofwat will not allow any flexibility to the framework. In the FD, Ofwat has justified the retainment of six-monthly reporting requirements on the basis that they "*will allow us to act in an agile way to any deliverability challenges arising during the period and work with companies to resolve these challenges*."[57] It is not clear to us how this will work in practice, particularly given that we will not be able to agree any changes to the design of PCDs within AMP to resolve such deliverability challenges. We therefore question the necessity for this burdensome level of reporting.

[55] Ofwat, February 2025, PR24 final determinations: Expenditure allowances, page 353, SOC-1-0006.

[56] Ofwat, February 2025, PR24 final determinations: Price control deliverables appendix, page 12, SOC-5-0011.

[57] Ofwat, February 2025, PR24 final determinations: Expenditure allowances, page 354, SOC-1-0006.

6. Error 5: PCD payments overlap with other penalties and expenditure adjustments under incentive mechanisms and statutory requirements, resulting in potential overlapping penalties

6.1. Overview

116. The PCD framework provides for both (i) allowance clawbacks (via non-delivery PCDs) and (ii) penalties (via time incentive PCDs and late delivery penalties).

117. Separately, companies face the risk of additional penalties for failures to deliver the same or similar outputs to those prescribed under the PCD framework. This risk arises from:

- **PCs and ODIs:** Ofwat sets PCs to incentivise companies to ensure they provide reliable, high-quality service to customers while protecting the environment. Most PCs are associated with ODIs, which provide for financial penalties (or rewards) for under (or out-) performance relative to levels of performance specified in the ODI.
- **Statutory and other regulatory requirements:** Companies are subject to a number of existing statutory and other regulatory obligations, where a failure to comply with such obligations can lead to financial penalties, typically as a result of enforcement action by the relevant quality regulator (e.g., the EA or DWI).
- **Alternative Ofwat enforcement routes:** Ofwat has powers under section 18 and section 22A of the WIA to take enforcement action against companies for breach of licence conditions and certain provisions of the WIA (including the general duties applicable to water and sewerage undertakers by virtue of section 37 and section 98 WIA respectively). Enforcement action can include the imposition of financial penalties. Examples of Ofwat enforcement action including Ofwat's announcement on 12 February 2025 that it has opened enforcement proceedings against Thames Water in respect of potential delays in delivering environmental protection programmes.[58]

118. Taken together, a company may be penalised multiple times for a failure to deliver the same output. The introduction of the PCD framework adds materially to the risk burden faced by companies.

6.2. PCD payments overlaps with ODIs

119. In the FD, Ofwat maintains that there are only limited overlaps between ODIs and PCDs with the impact of ODI underperformance payments equivalent to around 1% of the value of expenditure across the whole enhancement programme. Ofwat considers that this impact is not significant and that any overlap will not introduce a negative skew on the balance of risks. This is on the expectation that the delivery of programmes where ODIs and PCD payments overlap will be "*largely within the company's control*".[59]

120. It is not clear from the FD how Ofwat will mitigate the risk of overlaps between ODIs and PCD payments:

[58] Ofwat, February 2025, Enforcement case into Thames Water's potential delays in meeting key environmental protection programmes, SOC-5-0012.
[59] Ofwat, February 2025, PR24 final determinations: Expenditure allowances, page 309-310, SOC-1-0006.

- The FD states that "*where the impact of enhancement expenditure on ODI payments is likely to be material, companies can propose to net off the impact of under- or non-delivery on ODI payments*". This is subject to companies explaining how "the combination of PCDs, ODIs and cost sharing will more than recover the cost of enhancement so that they are worse off if they under-deliver or do not deliver the funded improvement".[60]
- However, Ofwat also explicitly states that it "*does not allow ODI payments to be netted off from PCD payments*". [61]

121. We consider that these statements are contradictory and fail to provide certainty that companies can net-off ODI payments from PCD payments (or vice versa).

122. We disagree with Ofwat's findings that there are limited overlaps between ODIs and PCDs. Such a conclusion only considers the short-term effects of investment and does not consider the effect of ODI payments across a lifetime of investment. It does not account for the impact that enhancement spend has on ODI penalties and rewards in future price control periods beyond AMP8.

123. PCDs and ODIs also overlap in terms of their incentive effect. While ODIs and PCDs are different types of mechanism, they serve (or at least should serve) the same purpose: to incentivise companies to deliver outputs that are in the interests of customers, and to provide protection to customers where companies fail to do so.

124. In practice, there is extensive overlap between ODIs and the PCDs. Our business plan forecast performance improvements (in most cases) expected as a result of investment driven by enhancement expenditure. The majority of enhancement expenditure has PCDs attached. The table below presents a summary of our DDR business plan OUT[62] tables. This forecast our 2029-30 performance for common PCs it identified the improvements driven by base and enhancement expenditure separately.

[60] Ofwat, February 2025, PR24 final determinations: Expenditure allowances, page 309, SOC-1-0006.

[61] Ofwat, February 2025, PR24 final determinations: Expenditure allowances, page 310, SOC-1-0006.

[62] Southern Water, March 2024, PR24 DDR Business plan tables - version 7, SOC-5-0013.

Table 55: Southern Water DDR common performance commitment forecasts 2029-30 (OUT 1, OUT2, OUT3)

Common PCs	PC reference	Units	OUT1 - Overall outcome performance	OUT2 - Outcome performance from base expenditure	OUT3 - Outcome performance from enhancement expenditure
			2029-30	2029-30	2029-30
Water supply interruptions	PR24_WSI	Time	00:04:30	00:17:37	00:13:07
Compliance risk index (CRI)	PR24_CRI	Numerical score	2.41	2.41	0.00
Customer contacts about water quality	PR24_WQC	Number	0.95	1.01	0.06
Internal sewer flooding	PR24_ISF	Number	1.33	1.33	0.00
External sewer flooding	PR24_ESF	Number	14.02	14.03	0.01
Biodiversity	PR24_BIO	Number	0.00	0.00	0.00
Operational greenhouse gas emissions (water)	PR24_OGW	Tonnes	52,838.68	174,859.56	122,020.88
Operational greenhouse gas emissions (wastewater)[63]	PR24_OGWW	Tonnes	185,332.02	49,536.97	-135,795.05
Leakage	PR24_LEA	%	31.7%	25.6%	6.1%
Per capita consumption	PR24_PCC	%	9.9%	-0.6%	10.5%
Business demand	PR24_NHH	%	-4.2%	-7.6%	3.4%
Total pollution incidents	PR24_POL	Number	24.02	24.02	0.00
Serious pollution incidents	PR24_SPL	Number	0.00	0.00	0.00
Discharge permit compliance	PR24_DPC	%	99.09%	65.66%	33.42%
Bathing water quality	PR24_BWQ	%	85.6%	85.6%	0.0%
River water quality (phosphorus)	PR24_RWQ	Number	0.7258	0.3363	0.3895
Storm overflows	PR24_SOF	Number	17.27	21.00	3.73
Mains repairs	PR24_MRP	Number	153.6	158.1	4.4
Unplanned outage	PR24_UNO	%	2.16%	2.18%	0.02%
Sewer collapses	PR24_SCO	Number	5.69	5.75	0.06

125. Table 55 above shows that significant performance improvements are forecast from enhancement e.g. our water supply interruptions (minutes lost) are forecast to reduce by 13 minutes 7 seconds as a direct result of enhancement investment (at our strategic WSW sites). If we do not deliver the enhancement investment (required at our WSW sites) we will face both an ODI penalty and further PCD clawback for value not delivered. This is just one example of the overlapping nature of the ODI and PCD regimes.

126. In view of Ofwat's ambiguous position in the FD, there remains a risk of overlaps between the two frameworks resulting in punitive overlapping penalties for companies.

[63] Greenhouse gas emissions (wastewater) are expected to increase as a result of the significant investment in N and P-removal schemes including increased biological and chemical treatment processes.

6.3. PCD payments overlap with regulatory penalties

127. A significant proportion of the outputs prescribed under the PCD framework overlap with existing obligations under statutory and other regulatory regimes with which we must comply. This gives rise to the risk of overlapping penalties i.e. more than one penalty being applied for the same actions.

128. As further described below, failure to comply with statutory and other regulatory obligations may lead to substantial financial penalties which arise directly from non-delivery of outputs that are required to be delivered under the PCD framework. These financial penalties may arise from enforcement action by Ofwat, as well as by the quality regulators (the EA, DWI and Natural England).

129. Moreover, a failure to deliver outputs required under the PCD framework may lead indirectly to penalties for non-compliance with statutory and other regulatory obligations, as the outputs prescribed under the PCD are also required in order to satisfy wider duties, obligations or objectives.

(i) Non-delivery of PCD outputs leading directly to penalties for non-compliance with our existing statutory and other regulatory obligations

130. For the majority of the PCDs applicable to Southern Water, we are required to deliver the prescribed schemes or outputs in order to achieve compliance with our existing statutory and other regulatory obligations. Those other legal obligations often create criminal offences in the event of non-compliance, leading to potentially significant financial penalties. Where a PCD is aligned with such existing obligations, non-delivery of the PCD can therefore not only lead to the imposition of financial penalties for non-delivery of the PCD but also lead directly to a financial penalty for non-compliance with the relevant statutory or regulatory obligations.

131. Examples of penalty overlaps between PCD outputs and our existing statutory and other regulatory obligations include:

- **Water Industry Act 1991:** Failures to provide outputs prescribed under a number of PCDs applicable to our expenditure (e.g., mains renewal, network reinforcement, lead, raw water deterioration and water safety) could lead to a financial penalty of up to 10% of company turnover under the WIA.
- **Environmental Permitting Regulations 2016 (EPR):** Failures to provide outputs prescribed to our PCD for the flow monitoring at WTWs could lead to unlimited criminal fines as a result of non-delivery, which constitutes an offence under the EPR.
- **WINEP**: WINEP sets out actions that water companies are required to take in order to meet statutory environmental obligations, non-statutory environmental requirements, and water companies' statutory functions. As WINEP is subject to approval by the Secretary of State, both he and Ofwat are able to bring enforcement actions under section 18 of the WIA in the event of non-delivery, including in respect of recovering funds provided to companies for projects that have not been delivered.
- **Reservoir Act 1975:** Failures to provide outputs prescribed under the PCD applicable to our reservoir safety investment could lead to unlimited fines as a result of any non-delivery, which constitutes an offence under the Reservoir Act 1975.

(ii) Non-delivery of PCD outputs leading indirectly to penalties for non-compliance with our existing statutory and other regulatory obligations

132. Other statutory or regulatory obligations are framed more broadly and are not therefore directly associated with the delivery of schemes or other outputs prescribed in a PCD. Nonetheless, in relation to certain such wider obligations or duties, delivery of one or more outputs prescribed in a PCD is a necessary action for the satisfaction of those wider obligations or duties.

133. For example, many of the PCD outputs are directly linked to ensuring compliance with the conditions of environmental permits, breach of which may constitute a criminal offence. Non-delivery of schemes or outputs which are aimed at achieving compliance with an environmental permit can therefore directly trigger the commission of criminal offences. These can lead to the imposition of financial penalties in the courts or by other forms of EA enforcement such as a Variable Monetary Penalty or Enforcement Undertaking. In such cases, the PCD framework gives rise to a risk of overlapping penalties.

134. This risk is exacerbated by the application of the Sentencing Council's Environmental Offences Definitive Guideline, which applies when courts impose sentences for breach of environmental permits. Under the Guideline, water companies are designated as 'Very Large Organisations' by virtue of their turnover, meaning they may be liable for the highest potential range of fines. Moreover, one of the factors used to determine the starting point for potential fines is the degree of culpability (ranging from low/no culpability at the lowest level to intentional at the highest). The second highest level of culpability under the Guideline is 'reckless', for which the level of fines imposed is increased significantly. It is likely that this classification would apply in cases where the commission of an offence has arisen in connection with circumstances where there has been a failure to undertake works that a company knew were required to be undertaken, and this might include where a company has failed to deliver outputs prescribed under the PCD framework.

135. There is therefore significant overlap between the penalties that apply for failure to deliver PCDs and those that apply in respect of other statutory or regulatory obligations.

136. It should be emphasised that these statutory and regulatory obligations are already actively enforced and, where relevant, penalties imposed. For example:

- In August 2018, Ofwat used its powers under the WIA to impose a penalty on Thames Water and, more significantly, to accept financial and non-financial commitments from Thames Water worth £120m, in respect of a breach of obligations in relation to the management of leakage reduction.[64]
- In August 2024, Ofwat used its enforcement powers under the WIA to impose financial penalties totalling £168 million on three companies in connection with spills from storm overflows, as well as imposing enforcement orders requiring the companies to rectify the infringements.[65]
- Breach of permit conditions is a criminal offence (under the Environmental Permitting Regulations (England and Wales) Regulations 2016) which is routinely enforced by the EA. In 2024, five out of the 10 largest penalties recorded by the EA were imposed on water companies for such offences. There is no cap on the maximum financial penalty which can be imposed for such offences, and very large fines have been imposed against water companies in recent years.
- On 12 February 2025, Ofwat opened an enforcement case into Thames Water after it indicated that delivery of more than 100 environmental improvement schemes was likely to

[64] Ofwat, August 2018, Investigation into Thames Water's failure to meet its leakage performance commitments, SOC-5-0014.
[65] Ofwat, August 2024, Enforcement case in Thames Water's management of its sewage treatment works and sewerage networks, SOC-5-0015., Ofwat, August 2024, Enforcement case in Yorkshire Water's management of its sewage treatment works and sewerage networks, SOC-5-0016., and Ofwat, August 2024, Enforcement case in Northumbrian Water's management of its sewage treatment works and sewerage networks, SOC-5-0017.

be delayed, having regard to Thames Water's commitment to deliver 812 schemes as part of the WINEP during the period 2020 to 2025.[66] If Thames Water is found to have failed to comply with its statutory obligations under the WINEP, it could face financial penalties of up to 10% of relevant turnover. The introduction of the PCD framework in AMP8 means that companies facing similar failures to deliver as Thames Water could face an overlapping penalty under the PCD framework as well as their statutory obligations under the WINEP.

Case Study (3): Phosphorous

Ofwat's approach in the FD

- Ofwat introduced a scheme-level PCD[67] to all wastewater companies delivering PR24 WINEP phosphorus removal enhancement schemes.
- It is clear that the relevant PCD is intended to be based on meeting tightened permit conditions for phosphorous.[68]
- In addition to claw back in the event of non-delivery, Ofwat will claw back allowed investment in the event of changes to schemes that are brought about by changes to key data in its model datasets (e.g. the allowance given by Ofwat relating to the differential between 'historic' and 'enhanced' permit conditions, and changes to the length of pipeline (km) and transferred flow (cu.md).
- Time incentive PCD: The PCD incorporates time incentives measured on a cumulative percentage of PE delivered. This requires delivery of a cumulative 25% of PE service by the end of year 3 (2027-28), 60% by the end of year 4 (2028-29), and 100% by the end of year 5 (2029-30).

Our concerns with the FD

Risk of overlapping penalties

- The PCD is unnecessary given that phosphorous levels are directly regulated and routinely enforced by the EA via permit conditions. Non-compliance with the permit is a criminal offence under the Environmental Permitting Regulations 2016 with the potential for an unlimited fine. Failure to deliver any scheme agreed with the EA, which contributed to any permit non-compliance would be an aggravating feature during any prosecution, directly reflected at sentencing by increasing the level of fine.
- There is a material risk that we could face double penalty in the event of breach of permit conditions relating to phosphorus, resulting in enforcement action by the EA, and a financial penalty being imposed by the courts for what is essentially the same non-compliance.

Risk of inconsistency with other obligations arising from lack of flexibility

- All phosphorous removal enhancement schemes are part of WINEP, even where revisions to permit conditions have not yet been formally imposed (in which case enhancement works are in anticipation of such permit changes). The PCD incentives fail to recognise any alternative delivery dates which may form part of WINEP scope or the conditions of the permit itself, nor does the PCD provide any flexibility to implement any changes even if agreed with the Environment Agency.
- Ofwat's approach also fails to acknowledge the general obligations introduced under the Water Targets Regulations 2023 (the **Water Targets**), under which we are expected to

[66] Ofwat, February 2025, Enforcement case into Thames Water's potential delays in meeting key environmental protection programmes, SOC-5-0012.
[67] See Ofwat, February 2025, PR24 final determinations: Price control deliverables appendix, pages 80- 91, SOC-5-0011
[68] Ofwat, February 2025, PR24 final determinations: Price control deliverables appendix, para 4.3.1, SOC-5-0011.

(a) reduce total phosphorus loadings from treated wastewater into freshwater by at least 80% by the end of 2038 (against a 2020 baseline), and (b) reduce total phosphorus through agricultural diffuse pollution by at least 40% by the end of 2038 (against a 2018 baseline). The statutory obligation therefore contains overlapping, but not identical obligations, which are to be satisfied over a different (significantly longer) timeframe. These continue significantly beyond this single AMP Period. This is not recognised in the PCD, thereby failing to allow work towards these targets to be aligned efficiently.

- Ofwat asserted69 that there should be "*a relatively lower number of significant changes to enhancement*" compared with others due to needing EA agreement for such changes. However, the fact that EA approval may be required for material changes does not mean that they will not take place - indeed, Ofwat appears to have recognised that schemes require design and engineering, hence its decision to not impose time incentives in years 1 and 2, and despite the existence of the wider obligations described above arising under the Water Targets.
- There is a material risk that we could face claw-back of the allowance regardless of the level of progress achieved and irrespective of whether we are delivering in accordance with WINEP, in accordance with the timelines stipulated in permit conditions, and/or in accordance with the Water Targets.

137. As the majority of our PCD outputs are actions towards achieving our existing statutory and other regulatory obligations, Southern Water is already subject to an existing incentive to deliver those outputs. This conclusion is reinforced by the overlap with ODIs described above.

138. On this basis, we submit that it is unnecessary and disproportionate for Ofwat to impose either non-delivery or time-incentive PCDs to incentivise delivery of relevant outputs.

6.4. DDCM

139. The FD provides for the DDCM, which returns allowances to customers where companies are materially underspending in the first two and first three years of the AMP to protect customers for paying for enhancements that are not delivered.

140. Ofwat claims that there is no overlap between the DDCM and PCDs because the cost reconciliation mechanism will reverse the impact of the DDCM before applying cost sharing and PCDs.

141. However, the delivery scope of the PCD would need to also be revised downward to reflect decreased allowances to truly avoid double counting and Ofwat does not comment on this element of duplication. DDCM applies to the enhancement allowance overall and the PCDs apply to specific schemes creating further challenges in preventing double counting where a DDCM clawback is triggered.

While the DDCM could theoretically avoid a duplicative effect with PCDs, Ofwat has failed to clearly present how this would be achieved and scope for duplication exists. As a result, there remains scope for punitive duplication from the two mechanisms.

69 Ofwat, February 2025, PR24 final determinations: Price control deliverables appendix, page 84, SOC-5-0011.

7. The proposed remedy

7.1. Introduction

142. We accept that a well-designed PCD framework has a legitimate role to play in protecting customers in relation to the delivery of outputs funded by enhancement expenditure, so that stakeholders and customers know what to expect from the funding provided.

143. We agree with the overarching objective of the PCD framework as Ofwat first proposed in its Draft Methodology, namely that where companies fail to deliver outcomes or outputs of enhancement expenditure, funding should be returned to customers. We also support the PCD principles set out in the PR24 Final Methodology, insofar that PCDs should (i) protect customers; (ii) be set at an outcome level where possible; and (iii) be set at the highest level possible to retain flexibility over benefits to deliver the most efficient solutions.

144. In our view, the PCD framework set out in the FD does not deliver for consumers. In order to be workable in operation and proportionate to the objective it seeks to deliver, the PCD framework should be structured in a manner that:

- ensures customers do not pay for projects which companies never deliver;
- imposes proportionate consequences for late delivery, to incentivise companies to deliver overall projects on time;
- does not conflict with the existing outcomes-based incentive framework (PCLs, ODIs);
- does not conflict with delivery requirements of quality regulators (e.g. EA and DWI) under existing regulatory and statutory obligations;
- ensures companies have the flexibility they need to manage their investment programme efficiently, including through:
  - the adoption of alternative outputs where that is in the interests of customers (e.g. to reflect regulatory developments or a developing understanding of the optimum solution, or to embrace innovative solutions); and
  - adjustments to delivery deadlines where agreed with the relevant quality regulator, which will be closer to the issues arising from the delivery of the outcome and the consequences or otherwise of shifting the programme dates;
- acknowledges the scale of the investment programme which water companies generally (and Southern Water in particular) are required to deliver in AMP8 compared with previous AMPs;
- recognises that, by their nature, large investment projects may encounter delays, in many cases for reasons that are beyond the control of management, such as planning constraints;
- acknowledges that companies have limited ability to pass on PCD risk to their supply chain, which ultimately will manage the majority of the PR24 investment programme;
- recognises that water companies are subject to a range of regulatory obligations to deliver enhancement projects, often to a scope and subject to deadlines agreed with the relevant quality regulator (e.g. EA or DWI), which in many cases are enforceable by financial penalties; and
- does not lead to perverse incentives.

7.2. An alternative PCD framework - Overview

145. We request that the CMA in its redetermination adopt a PCD framework which differs significantly to that comprised in the FD. That alternative framework would be 'light touch' in comparison to that developed by Ofwat for the FD but more apt to deliver on the requirements outlined above.

146. This alternative PCD framework would include the following key features, further details of which are set out in the sections that follow:

- A **non-delivery PCD** mechanism, which is limited to cases where companies fail to commence or otherwise cancel the delivery of an output. It would not be triggered where delivery is delayed.
- A two-way **time-incentive PCD**, under which a late delivery penalty would apply where companies fail to deliver outputs by the prescribed delivery date. A reward would be available for early delivery.
- **Amendments to the scope of Ofwat's base expenditure PCDs** in respect of mains renewal and network reinforcement.
- A **within-AMP adjustment mechanism** under which a company may request Ofwat to modify a PCD in respect of outputs and/or delivery dates so as to reflect certain within-AMP developments.
- An **offset mechanism** to address the financial double jeopardy associated with overlaps between PCDs and ODIs. The PCD penalty would be reduced by an amount equal to any ODI payment associated with a failure to deliver the relevant PCD output.

7.3. Proposed remedy - Non-delivery PCD mechanism

147. The non-delivery PCD mechanism should have the following features:

- **Scope:** A non-delivery PCD payment would be triggered only where the company either:
  - fails to commence work on a specified output or
  - commences work on a specified output but then decides to cancel (rather than postpone) delivery of the output.
- In contrast to the position under the FD, a non-delivery PCD payment would not be triggered by delayed delivery – that is, delivery of the specified output after the end of AMP8 (or the specified delivery date, as the case may be).
- **Areas of expenditure to which the PCD would apply:** The areas of expenditure to which this non-delivery PCD would apply would generally be the same as those specified in the FD. Moreover, except to the extent that changes are necessitated by the differing nature of the non-delivery PCD, the PCD requirements for each area of expenditure (e.g., the deliverable, measurement and reporting, payments etc) would be the same as those adopted in the FD. An exception to this general rule would be made for the requested amendments to base expenditure PCDs as set out at Section 7.5 below.
- **Delivery date:** A non-delivery PCD would be engaged only where a company has failed to commence delivery of (or cancelled) a specified output either:
  - by the relevant delivery date is prescribed by a quality regulator (e.g., the EA or the DWI, as the base may be), which may be beyond AMP8; or
  - where no date is prescribed by a quality regulator, by the end of AMP8, (the "Delivery Date").
- **Assessment date:** The non-delivery PCD would be assessed at the relevant Delivery Date (which for most purposes will be within AMP8).

- **Retainment of efficiently incurred costs:** Where a company has incurred costs in respect of an output subject to a non-delivery PCD which is subsequently cancelled, any non-delivery payment due would be reduced to the amount of the unspent allowance where that can be demonstrated to have been efficiently incurred.
- **Within-AMP adjustment mechanism:** The non-delivery PCD mechanism would be subject to the within-AMP adjustment mechanism (see section 7.6 below).
- **Net-off of overlapping penalties:** Any non-delivery payment would be reduced by an amount equal to any overlapping ODI penalty borne by a company in respect of the same output (see section 7.7 below).

7.4. Proposed remedy - Time incentive PCD:

148. The time-incentive PCD mechanism should have the following features:

- **Application:** A time incentive PCD would apply only in respect of Southern Water's PCD outputs for which a quality regulator has set the relevant Delivery Date. This is without prejudice to the request amendments to base expenditure PCDs as provided at Section 7.5 below.
- **Assessment date:** The PCD would be assessed at the relevant Delivery Date. The incentive penalty would apply from the first day following the relevant Delivery Date. These late delivery payments would accrue on a monthly basis up to a maximum of 5 years.
- **Penalty and reward rates:** the time incentive penalty would apply as a two-way incentive:
  - Penalty payments would be made by Southern Water where it fails to deliver the required PCD output by the relevant Delivery Date; and
  - Southern Water would receive reward payments where it delivers the required PCD outputs ahead of the Delivery Date.
- The underperformance payment would be based on the company's WACC multiplied by the unit allowance. The outperformance to underperformance ratio would be set at 2:3.[70] The rates shall be equally measured and applied on a monthly basis.
- **Non-delivery PCD:** A non-delivery PCD would apply in addition to the time incentive penalty only where Southern Water subsequently determines that it will cancel the relevant project. In these circumstances, and in line with Section 7.3 above, any non-delivery payment due would be reduced to the amount of the unspent allowance.
- **Within-AMP adjustment mechanism:** The non-delivery PCD mechanism would be subject to the within-AMP adjustment mechanism (see section 7.6 below).
- **Net-off of overlapping penalties:** Any non-delivery payment would be reduced by an amount equal to any overlapping penalty borne by a company in respect of the same output (see section 7.7 below).

7.5. Amendments to base expenditure PCDs

149. The following remedies are required to address the errors set out above in respect of Error 5:

- Modify the PCD specification for mains renewals so that it covers only renewals related to cost adjustment allowances (i.e. allowances over and above modelled base allowances) including any enhancement.

[70] As we set out at Section 3.4 above, Ofwat has relied on PR19 programme data to set the reward:penalty ratio for the time incentive penalty. This overestimates the proportion of projects that will be delivered on time. Based on KPMG's Risk Analysis, 60% of projects will be delivered on time, which means that a 2:3 ratio is appropriate.

- Modify the PCD specification for network reinforcement so that any non-delivery penalty clawback aligns to and does not exceed the cost adjustment uplift (i.e. excludes the implicit allowance).

7.6. Proposed remedy – Within-AMP adjustment mechanism:

150. There should be a within-AMP adjustment mechanism under which a company may request that Ofwat modify a PCD (both a non-delivery PCD and a time-incentive PCD) to reflect developments since the PCD was set.

151. The within-AMP adjustment mechanism should comprise features which include:

- **Adjustments to outputs:** Ofwat would be required to modify the outputs prescribed under the PCD to align with any modified outcomes or outputs agreed with the relevant quality regulator (e.g. the EA or DWI).

  In other case, companies would be permitted to make general requests for modifications to PCD outputs.

  In either scenario, adjustments to outputs might be required to accommodate, for example, (i) external factors beyond Southern Water's control, which impact delivery of the PCD outputs; and (ii) changes to outputs which reflect a more efficient and/or innovative means of delivering outcomes for the benefit of consumers.

  With respect to requested changes to outputs that are not driven by a modification agreed with a quality regulator, Ofwat would assess whether:

  (i) the modified output would result in an equivalent or materially better consumer outcome than the original specification; and
  (ii) any cost savings are attributable to efficiency or innovation.

  Where Ofwat considers that either or both of these requirements is not met, its approval of a change to outputs would be conditional on proportionate changes to allowances appropriate to ensure that the interests of consumers are protected. Otherwise Ofwat would be required to approve the change to outputs without any change to Southern Water's relevant allowances.

- **Adjustments to Delivery Dates:** Ofwat would be required to modify a PCD Delivery Date to align with changes to the Delivery Date agreed with the relevant quality regulator (e.g. the EA or DWI).

  With respect to PCDs for which the Delivery Date is not set by a quality regulator, companies would be permitted to make general requests for modifications to the PCD Delivery Date. In such cases, Ofwat would assess whether:

  (i) the modified output would result in an equivalent or materially better consumer outcome than the original specification; and
  (ii) any cost savings are attributable to efficiency or innovation.

  Ofwat would be required to approve changes to the Delivery Date except where it can demonstrate that at least one of these requirements is not met.

7.7. Proposed remedy – No double-counting of penalties

152. There should be an offset mechanism in order to address the financial double jeopardy arising from overlaps between PCDs (both non-delivery and time incentive) and ODIs.

153. The mechanism would have the following features:

- Mechanism trigger: An offset against a PCD penalty would be permitted where Southern Water can demonstrate that its failure to deliver outputs as required by a PCD materially contributed to an obligation on Southern Water to make an ODI payment.
- Amount of offset: Where an offset is triggered, the extent of the offset would be limited to the amount of the ODI payment which Southern Water can demonstrate was associated with its failure to deliver the relevant PCD outputs.

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Chapter 6
Performance Commitments (PCs) and Outcome Delivery Incentives (ODIs)

from Southern Water

1. Executive Summary

1. Performance Commitments (**PCs**) are the measures defined by Ofwat to assess water company performance and deliver outcomes. Performance Commitment Levels (**PCLs**) are the specific targets that Ofwat sets for each PC that it expects companies to deliver. Most PCs are linked to an Outcome Delivery Incentive (**ODI**), which provides financial penalties for under-performance and rewards for out-performance, in each case relative to the PCL.

2. We have identified significant errors in how Ofwat has calibrated our PCLs and ODIs. Ofwat's failure to capture company specific risk factors in its calibration of PCs and ODIs disproportionately exposes us to outsized risk.

Errors

3. At PR19, Ofwat adopted a marginal benefits-based approach to setting ODI rates. Ofwat aimed to improve upon this in PR24 and set ODIs directly from customer research they ran themselves on behalf of the industry. However, mid-way through the PR24 process Ofwat abandoned this and moved to a 'top-down' framework[1]. This change meant that companies were not able to factor in the needs and priorities of their own customers in determining ODI rates. Ofwat's methodology also led to unjustified changes in incentive rates compared with those set at PR19.

4. The FD PC/ODI package contains a number of overarching errors as follows:

- **Error 1: RoRE risk exposure with a large downward skew:** The FD's ODI package, as well as Ofwat's overall approach to the PCs and ODIs framework, are skewed towards penalties. This is set out further in Chapter 1 (Risk and Financeability), where the P50 for a notional company like Southern Water is -0.50% of RoRE, with unrealistic performance expectations, and disproportionately high penalty rates. These do not represent a "fair bet", or a reasonable incentive on the company to succeed. This error applies to all 12 PCs outlined below;
- **Error 2: Exogenous factors:** Ofwat has not considered exogenous factors (i.e. extreme weather events, unique geographical characteristics) and incidents beyond management control when setting ODIs and PCLs. Again, this would likely result in penalties that the company could little to change. This is inconsistent with past regulatory precedents and other sectors where fair and achievable incentives have been set; this error applies to 8 out of 12 PCs outlined below;
- **Error 3: Calibration:** In the FD, there are several specific calibration errors which will have a negative impact on our business. They centre around the following areas: ODI rates, PCLs, caps, collars, deadbands and overall risk mitigation measures (i.e. ASM and OAM); this error applies to all 12 PCs outlined below;
- **Error 4: The fundamentals of Southern Water are different from other companies**: Applying a national policy in some PCLs/ODIs would result in unjust penalty due to company specific factors, where Southern Water is different from other companies, by its fundamental characteristics. This error applies to 2 out of the 12 PCs outlined below.

5. We then identify 12 performance commitments where significant correction is needed due to these overarching errors having a material impact.

[1] Ofwat, August 2023, PR24: Using collaborative customer research to set outcome delivery incentive rates, page 3, SOC-66-0001.

6. In addition, Ofwat has made specific errors in respect of its setting PCLs, ODIs and/or risk mitigation measures for:

- Water Supply interruptions (**WSI**);
- Compliance Risk Index (**CRI**);
- Total Pollution Incidents;
- Serious Pollution Incidents;
- Storm Overflows; and
- the measures of experience (C-MeX, D-MeX and BR-MeX)

7. In addition, Ofwat has not addressed the downward risk exposure inherent in our outcomes package due to the absence of risk protection. We propose to introduce or tighten further collars on the following PCs to mitigate this risk:

- Bathing Water Quality;
- Leakage;
- Water Quality Contacts; and
- Discharge Permit Compliance.

8. Finally, Ofwat has applied a deadband to its Outturn Adjustment Mechanism (OAM) of +/-50bps, this undermines the intent of the OAM to balance the package of ODIs.

Impact and remedies

9. Ofwat should remove the deadband on the OAM to ensure it fully mitigates sector wide and delivers a balanced risk and reward package for ODIs.

10. Given the significant number of overarching errors identified in the setting of Southern's PCLs and ODIs, we outline in the table below, both the impacts and the specific suggested remedies to solve for the errors. The impacts are defined by a reduction in P10 and/or P50 risk through a combination of incentive rate changes, PCL changes and tightening the collars.

11. The PC/ODI framework in the FD creates significant risk for a notionally efficient company operating in the Southern Water region. Solving the errors we are proposing significantly reduces this risk by c. £247m and create a much more balanced package for the PC/ODI framework.

Table 1: Summary of the identified errors and remedies for each PC

PC	Driver	Error	Remedy	Impact (£m)
Water PCs				
Water Supply interruptions (WSI)	RoRE risk, exogenous factors, calibration error	ODI rate, PCL and risk mitigation (collar)	Change ODI rate to 0.329 Change PCL to 00:09:18 for 25/26 with a glidepath of equal increments down to 00:05:32 in 29/30 Tighten collar to -0.5% RoRE	• £27.3m
Compliance Risk Index (CRI)	RoRE risk, Calibration error	Risk mitigation (deadband and collar)	• Change deadband to 3.33 for 25/26 with a glidepath to 2.00 in 29/30 Introduce -0.5% RoRE collar	• £7.8m
Wastewater PCs				

Total Pollution incidents	RoRE risk, calibration error, exogenous factors and fundamentals of Southern Water	ODI rate and PCL	• Change ODI rate to 0.379 • Change PCL level to 30.59 in 25/26 with glidepath down to 22.78 in 29/30	• £60.6m
Serious Pollution incidents	RoRE risk, calibration error, exogenous factors and fundamentals of Southern Water	Risk mitigation (collar)	• Introduce -0.5% RoRE Collar	• £17.6m
Storm Overflows*	RoRE risk, calibration error, and exogenous factors	ODI rate and PCL	• Change PCL to 20.45 in 25/26 to 17.27 in 29/30 • Change ODI rate to 0.393 • +/-0.25% RoRE cap/collar	• £17.7m
Retail measures				
C-MeX	RoRE risk, calibration error	ODI rate and PCL	• Recalibrate PCL using a downward adjustment of 6 in 25/26-27/28 and 7 in 28/29-29/30 • Change ODI rate to 0.431	• £48.8m
D-MeX	RoRE risk, calibration error	ODI rate	• Change ODI rate to 0.134	• £27.3m
BR-MeX*	RoRE risk, Calibration error	ODI rate	• Change ODI rate to a maximum of 0.1% of RoRE	• £1.3m
Other				
Downward risk exposure (Leakage, Water Quality Contacts, Discharge Permit Compliance and Bathing Water Quality*)	RoRE risk, calibration error, exogenous factors	Risk mitigation (collars)	• Leakage: Introduce -0.5% RoRE collar • WQC: Introduce -0.5% RoRE collar • DPC: Introduce -0.5% RoRE collar • BWQ: tighten cap/collar to +/-0.25% RoRE	• £39.1m

The above is based on KPMG's risk modelling for a notional company, such as Southern Water, unless stated otherwise. This approach aligns with the methodology outlined in Chapter 1 (Risk and Financeability).

*not modelled under the notional scenario given lack of historical data, we use alternative scenario analysis to derive £m impact.

2. Background to Performance Commitments and Outcome Delivery Incentives

12. PCs define the level of service for a particular outcome which Ofwat expects companies to deliver. Most PCs are accompanied by ODIs, which generally make provision for financial penalties for under-performance and rewards for out-performance, in each case relative to the Performance Commitment Level (or a performance band set by reference to the PC level).

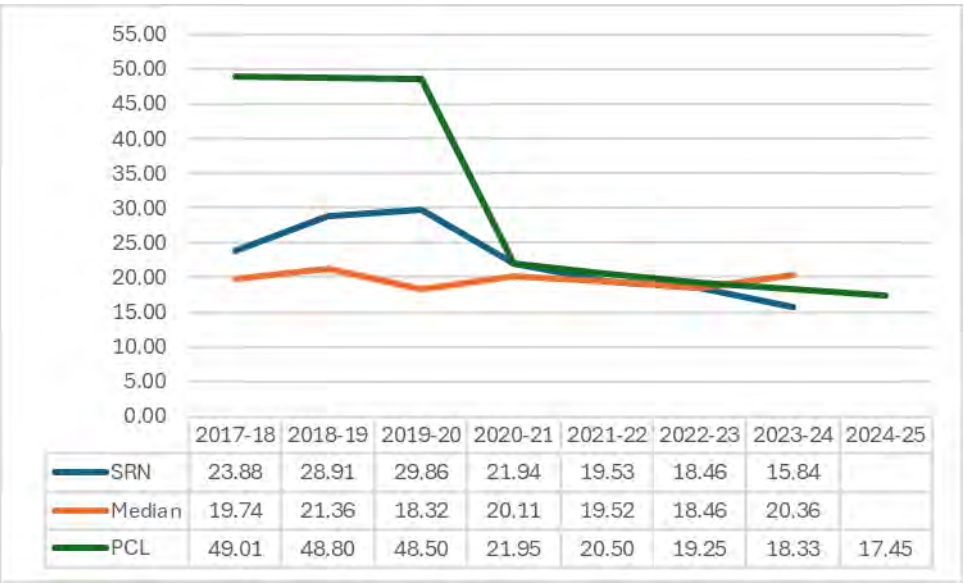
13. Ofwat sets PCs and ODIs to incentivise companies to provide reliable, high-quality service to customers while protecting the environment.

2.1. Our long-term performance and the impact of 2019 Price Review (PR19)

14. PCs and ODIs have been a feature of Ofwat's regulatory framework since the 2014 Price Review (PR14) in respect of the 2015-2020 'AMP6' period.

15. PC levels are set by Ofwat as improving targets year on year. However, failure to meet a PC level does not mean improvement in the performance has not been made. A good example of this is external sewer flooding. As shown in Figure 1, whilst our performance has improved year on year, the level of improvement under the PCL target has also increased year on year.

Figure 1: External sewer flooding incidents per 10,000 sewer connections performance



	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
SRN	23.88	28.91	29.86	21.94	19.53	18.46	15.84	
Median	19.74	21.36	18.32	20.11	19.52	18.46	20.36	
PCL	49.01	48.80	48.50	21.95	20.50	19.25	18.33	17.45

16. Ofwat considers failure to meet the target as a sign of underperformance. However, there is no recognition of improving performance because the target is stretching each year.

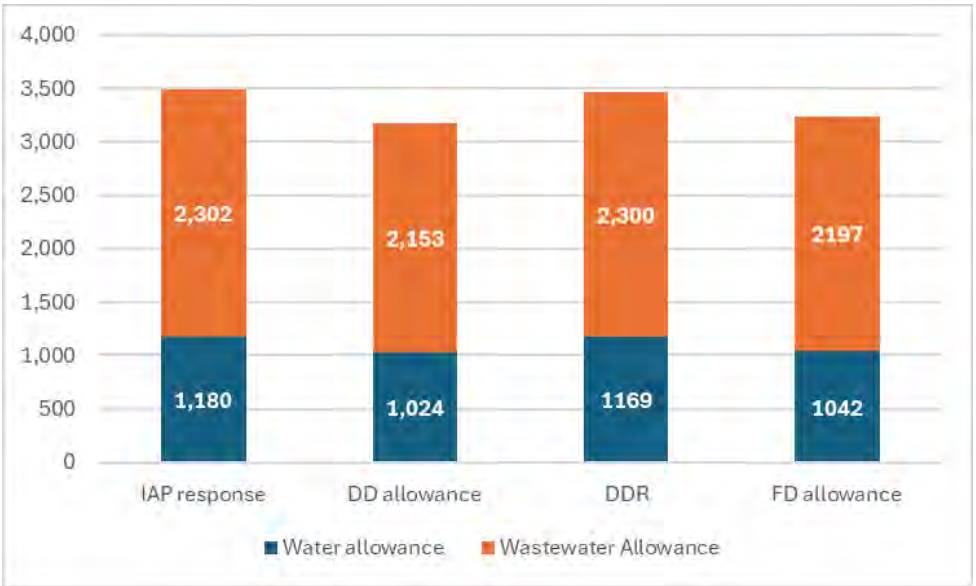
17. Historically, Ofwat assessed companies' performance against its Overall Performance Assessment (**OPA**) framework of which Southern was an average performer.[2]

18. The OPA was superseded in PR14 by the Service Incentive Mechanism (SIM) which was used to assess companies' customer service performance during AMP6. For the first three years of AMP6 (2015-16 to 2017-18) Ofwat published a service delivery report, this report assessed companies across various metrics, including leakage, customer satisfaction, pollution incidents, and overall expenditure.[3]

19. From 2018-19 Ofwat started to publish a more in-depth service delivery report which was later named the Water Company Performance Report (**WCPR**). The report generated a league table ranking company performance. Ofwat categorised the companies based on their performance, classifying them as leading, average, or lagging. Since 2019-20 we have been in the lagging category every year. Since 2022-23, no company has been in the leading category.

20. In PR19, Ofwat set extremely stretching PC targets, which were set with the ambition that all companies would achieve industry upper quartile performance.[4] As shown in Figure 2 below, Ofwat also set allowances which were £243m lower than our original business plan and £230m lower than our DD Response.

Figure 2: PR19 Wholesale allowances (2017-18 prices)

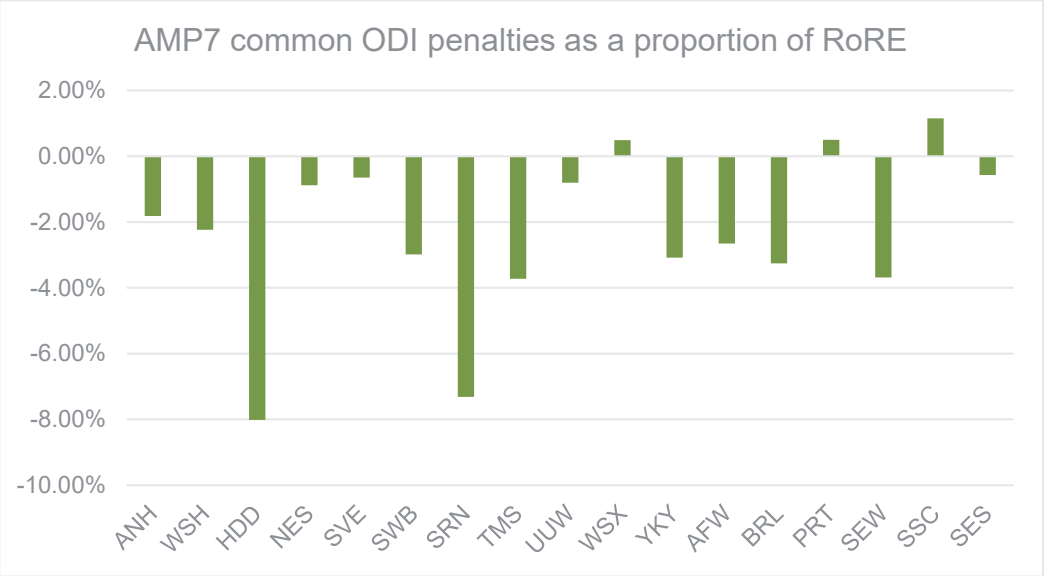


21. Since allowances are much lower than business plans, achieving the targets becomes even more challenging.

22. We had 31 financial ODIs in the AMP7 period and since 2020-21, we have significantly underperformed against the PC targets set by Ofwat, receiving underperformance penalties against 11 PCs. By 2022-23 we received in-period underperformance penalties equating to £129m in 2017-18 prices.

[2] Ofwat, Historical performance, SOC-6-0002.
[3] Ofwat, January 2019, Service and delivery report, SOC-6-0003.
[4] Ofwat, December 2017, Delivering Water 2020: Our methodology for the 2019 price review Appendix 2: Delivering outcomes for customers, page 49, SOC-6-0004.

Figure 3: Net position: The AMP7 ODI framework was an unbalanced framework for the industry, as demonstrated by the diagram below.



23. Figure 3 sets out the AMP7 common ODI penalties as reported in the Water Company Performance Report[5] (**WCPR**) as a proportion of RoRE for each company for the first 4 years of AMP7. These include, C-MeX, Leakage, WSI, CRI, PCC, Mains Repairs, Internal Sewer Flooding, Pollution Incidents, Sewer Collapses and treatment works compliance. This information was derived from Ofwat's latest WCPR data. This demonstrates that the AMP7 ODI framework was unbalanced for the industry. The average common metrics ODI penalty for AMP7 is -2.33% of RoRE. There are only 3 companies (Wessex Water, Portsmouth Water and South Staffordshire Water) that are outliers having earned a small RoRE upside from the PR19 regime.

24. Improved performance against PC targets is driven through targeted base expenditure, improving the resilience and performance of the existing asset base. We have an ageing asset base and historically have not focused our spending on improving the resilience of our assets. This is partly down to management decisions that prioritised customer service but can also be evidenced by continuous underfunding in each AMP, this is discussed in the background chapter.

2.2. Our new ownership and our turnaround plan

25. We are investing significantly to turn performance around. In September 2021, funds managed by Macquarie Asset Management (Macquarie) invested £1.1bn in equity in Southern Water and retain an 87% equity stake. Following its initial investment, Macquarie has invested an additional c.£550m in Southern Water to provide funding on top of the regulatory allowance.

26. We published our turnaround plan in May 2023, which covered our key priorities for improving our performance for the last two years of AMP7 (2023 to 2025). Our overall goal was to provide a better service to our customers and to ensure that we are doing everything we can to protect our environment in the years ahead.

[5] Ofwat, September 2024, Water company performance report 2023/24 data, SOC-6-0005.

27. Our turnaround plan was a commitment to our customers to deliver significant programmes of work across our four key pillars: (1) Trusted and easy customer service; (2) Healthy rivers and seas; (3) A reliable supply of water; and (4) Empowered and supported colleagues. This contained 16 actions and 53 specific programmes of work we were committed to undertake in order to drive improvements for our customers[6].

28. Our turnaround plan focused on 13 of our most important priorities:

- C-MeX;
- D-MeX;
- CRI;
- Leakage;
- PCC;
- Internal Flooding;
- External Flooding;
- WSI;
- Pollution Incidents;
- Unplanned Outage;
- Treatment Works Compliance;
- Mains Repairs; and
- Sewer Collapses.

29. Over the period of the turnaround plan, we have made a step change in performance in treatment works compliance, pollution incidents, CRI, Sewer collapses, PCC, unplanned outage and flooding. We update our turnaround plan[7] every six months and this is published on our website. In these updates we describe the progress we have made in our step change in performance and how we are progressing in delivering our commitments.

30. By 2024/25 we will have significantly improved performance in 10 of our 13 performance commitments we have been targeting. This has taken a large amount of overspend, namely ~£1.3bn (17-18 prices)[8] in water and wastewater combined. Despite these improvements, we are still incurring large underperformance payments.

3. Key drivers of Ofwat's errors

31. We have identified a number of failings with respect to the PCs and ODIs as specified in the FD. The failings with respect to the specific PCs/ODIs stem from several over-arching errors which Ofwat has made in its approach to PCs/ODIs.

32. As set out in Chapter 1: Risk and Financeability, our risk analysis, which quantified the risk exposure from the FD for a notional company with Southern Water's characteristics, revealed the following risk exposure for ODIs + MeXes: a negative P50 of -0.50%, a P10 of -1.56% and P90 of 0.57% of RoRE.

[6] Southern Water, Our Business Turnaround Plan, SOC-6-0006.

[7] Southern Water, Our Business Turnaround Plan, SOC-6-0006.

[8] Ofwat, December 2024, PR24-FD-PD14-Cost-sharing-reconciliation, worksheet "cost sharing calculations" cells F34 and F478, SOC-6-0007.

33. In this Section 3, we set out those overarching errors. We then outline the specific errors and our proposed remedies for each PC/ODI in Section 4.

3.1. Ofwat's inconsistent approach to setting ODIs

34. ODIs were first introduced in PR14 on the basis that an effective ODI package should result from a framework in which companies are incentivised to improve service levels at efficient costs and where the improvement is sufficiently valued by customers, whilst balancing broader considerations for financeability in well calibrated downside scenarios:

> *"For the first time, companies have developed a set of outcomes that reflect what their customers need, want and can afford, and they have committed to delivering these. Outcomes focus on what a company can deliver with its assets and capabilities, not how many assets it has."*[9]

35. At PR19, Ofwat continued to use this approach, by setting ODI rates using a bottom-up method. Under this method, Ofwat built up each incentive rate using detailed company specific information about costs and benefits. This allowed Ofwat to set rates that should have, in principle, reflected marginal benefits and costs of outcomes. This meant that if a company spent money to improve a service, Ofwat would have expected this improvement to be worth what people are willing to pay for it (**WTP**) and the cost to provide that service should match the marginal cost (**MC**).

36. This method results in incentive rates that are aligned with customer preferences for improvements. It is a well-established approach in setting ODI rates across regulated infrastructure sectors to align investment decisions with customer preferences. For example, in its 2016 consultation document on the proposal for outcome-based regulation, the CAA stated that "*we want to build on best practice approaches to service quality regulation being developed in other sectors*".[10] In this document, the CAA also included a reference to Ofwat's PR14 periodic review which introduced the Outcome Delivery Incentive (ODI) regime.[11]

37. In its PR24 Final Methodology, Ofwat's initial plan was to use a similar approach to PR19 in setting ODIs at PR24[12]. Ofwat reiterated that using a bottom-up approach best aligns the interest of companies with the interests of customers and the environment. Ofwat stated that "*We consider there are benefits to using a bottom-up approach to setting incentive rates, particularly for customer-facing and environmental performance commitments*."[13]

38. Ofwat announced in August 2023 that it would move away from a bottom-up approach to a top-down framework with symmetrical rates. Ofwat cited issues with its collaborative customer research, and difficulties in mapping from service incidents customers valued to PC definitions.[14] This marked a substantial change in approach mid-way through a price review, which impacted our investment planning by causing ODI rates to move substantially.

[9] Ofwat, December 2014, Setting price controls for 2015-20 Final price control determination notice: policy chapter A2 – outcomes, SOC-6-0008.
[10] CAA, December 2016, Future of service quality regulation for Heathrow Airport Limited: Consultation on the design principles for a more outcome-based regime, page 13, box 2, SOC-6-0009.
[11] CAA, December 2016, Future of service quality regulation for Heathrow Airport Limited: Consultation on the design principles for a more outcome-based regime, page 15, SOC-6-0009.
[12] Ofwat, December 2022, Creating tomorrow, together: Our final methodology for PR24 Appendix 8 Outcome delivery incentives, page 5, SOC-6-0010.
[13] Ofwat, December 2022, Creating tomorrow, together: Our final methodology for PR24 Appendix 8 Outcome delivery incentives, page 6, SOC-6-0010.
[14] Ofwat, August 2023, PR24: Using collaborative customer research to set outcome delivery incentive rates, page 3, SOC-6-0001.

39. Ofwat's top-down framework means that there is a limited relationship between marginal benefits (**MB**) (as previously measured through willingness-to-pay analysis) and MC of achieving performance improvements. Ofwat set ODIs by considering the amount of RoRE at risk, and start with a 0.5% amount of RoRE for each ODI and then considered customer research and government strategic priorities to rank PCs into three groups, with higher priorities having higher RoRE at risk.[15]However, this is a rudimentary approach compared with the bottom-up approach at PR19, which used company specific customer research to set marginal benefits. This decoupling in approach threatens the original purpose of the framework and effectively makes Ofwat the *de facto* representative of customer preferences.

40. Ofwat acknowledges that its attempt to set ODI rates using a bottom-up approach based on common customer research has failed and that its alternative top-down approach based on RoRE allocation is not consistent with individual companies' customer priorities. In the DD, Ofwat noted that:

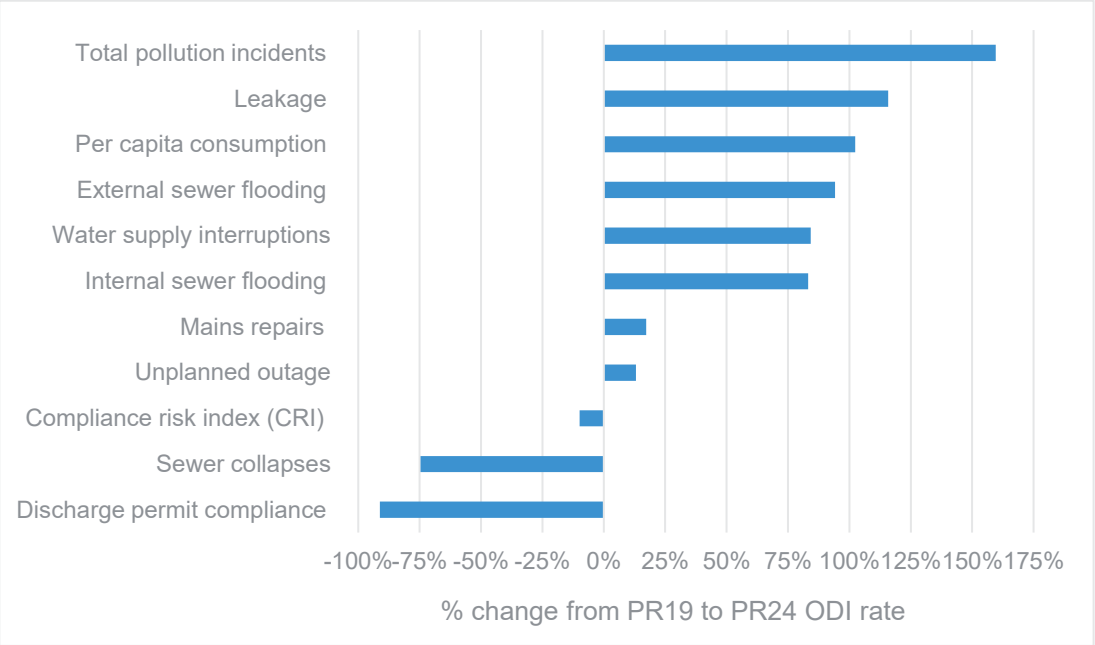
> *"At PR24, we want to provide a more consistent approach to setting ODI rates. For most performance commitments, we planned to do this using a 'bottom-up' approach based on customer surveys. Due to difficulties mapping our performance commitments definitions to survey results from service incidents customers could relate to, we were unable to derive robust marginal benefit estimates. Therefore, we moved to a 'top-down' approach based on equity return at risk which we adjusted to reflect customer priorities from our research."*[16] (emphasis added)

41. Ofwat finalised its first version of the top down ODI rates in August 2023, with the expectation that companies state these ODI rates in their business plans or give a reason as to why they should be different. Business plans were due in October 2023, giving limited time to complete business planning and investment appraisal. Ofwat set new ODIs in the DD based on an updated view of the top-down approach and a final version of ODIs in the FD. The ongoing inconsistencies and frequent changes throughout the process have adversely impacted business planning and prioritising investments over multiple AMPs.

42. Ofwat's final version of the ODIs in the FD are significantly different to PR19 ODIs which were more aligned with customer preferences for improvement. The PR24 ODI rates are higher for most PCs with an average increase of 45% with pollution incidents having a 160% increase in its ODI rate, part of the reason for this stems from the starting point of 0.5% amount of RoRE at risk.

[15] Ofwat, August 2023, PR24: Using collaborative customer research to set outcome delivery incentive rates, page 39, SOC-6-0001
[16] Ofwat, July 2024, PR24 Draft determinations: Delivering outcomes for customers and the environment, page 18, SOC-6-0011.

Figure 4: Southern Water's ODI unit rates relative to PR19 underperformance rates[17]



3.1.1. Ofwat's approach to setting Performance Commitment Levels (PCLs)

43. In the DD, Ofwat sets some PCLs using the PR19 PCL as a 24/25 baseline. This effectively assumed that companies should have achieved their AMP7 PCLs and would continue to further improve in AMP8, even if companies had indicated that they were not going to achieve the AMP7 target. In the FD Ofwat moved away from their blanket approach to using the PR19 PCL as a starting point in the DD, and instead set the baseline at an industry median forecast 2024/25 performance, this approach is more aligned to a starting point that is achievable although this is still a forecast but actual 2024/25 performance for the industry could be significantly different.

44. Nonetheless, we still have some issues with certain PCs, namely WSI, Total Pollutions Incidents, Storm Overflows and C-MeX. Those PCLs are not a fair reflection of actual AMP7 outturn performance and represent a level of stretch which is not reflective of setting a fair[18] target.

45. In addition, Ofwat has set PCLs on a sector wide basis without considering the impact of our regional characteristics on our performance (outlined in overarching error 4). There are characteristics of our region which may make these sector wide targets more challenging for us to achieve, for example EA designated protected areas and pollution incidents[19]. Since the FD targets do not consider these challenges, we are more likely to incur significant penalties.

46. Below we explain the five overarching errors in the FD that result in miscalibration of setting PCs and ODIs.

[17] Ofwat, December 2024, PR24-FD-OC03-ODI-rates , SOC-6-0012. For graph see Southern Water, ODI PR19 vs PR24 unit rates graph, SOC-6-0013.
[18] By 'fair', we mean 'fair bet' and hence just as much opportunity to outperform and underperform
[19] KPMG, March 2025, Impact of exogenous risk factors on wastewater ODI performance, page 5, SOC-1-0004.

3.1.2. Overarching Error 1: Ofwat's approach in the FD has created a significant RoRE risk exposure with a large downward skew

47. Southern Water's PR24 ODI package is heavily skewed towards penalties. This asymmetry comes from a combination of excessively stretching PCLs (some require performance at the PR19 upper quartile from the commencement of the PR24 period) and Ofwat's top-down approach to setting incentive rates. It results in higher penalty rates than are appropriate.

48. To model the risk analysis Ofwat used the PCL set in the FD as the assumed 'anchor point' on base case performance or the most likely performance. The P10 and P90 AMP8 risks were derived using distributions calibrated on AMP6 PC performance.

Figure 5: Ofwat's view of P10, P90 risk ranges for ODIs

49. The analysis shown at Figure 5 assumes companies are appropriately funded. However, the FD approach to setting cost allowances is inconsistent with the approach to setting PCLs, this suggests most companies are unlikely to meet Ofwat's targets. This is because botex allowances are based on what companies have spent in the past (and by implication the service levels they have delivered in the past). However, most PCLs are set beyond the median level of performance actually observed by the sector (i.e. up to 2023/24). This approach requires the sector to deliver materially more with no additional funding. The average company will incur penalties even if it is improving performance levels for customers. Rewards can only be earned where a step change in

performance is delivered. However, the funding allowed by Ofwat in the FD does not enable Southern Water to make this step change.[20]

50. Ofwat has added several collars to key ODIs.[21] While the addition of collars reduced skew on the overall package, it did not eliminate the skew entirely. The PCs for Compliance Risk Index (**CRI**), Discharge Permit Compliance (**DPC**) and Serious Pollution Incidents impose penalty only ODIs. For these PCs, companies can only be penalised for underperformance, with no reward payments for outperformance. In the FD, the deadband level (i.e. the range within the performance of a metric that is neither penalised nor rewarded, allowing for minor fluctuations without a financial impact) was reduced for CRI and added for the DPC and Serious Pollution Incident ODIs. However, by nature of a penalty-only ODI, this will still contribute to skew by design as the downside scenario includes penalties on these ODIs while the upside does not include rewards.

51. The scale of the penalties is significantly larger than PR19 as Ofwat has increased rates in most cases (see Figure 4). There is a clear asymmetry to these interventions. This is captured by the extension of companies' downside for RoRE.

52. Ofwat has made some adjustments in the FD where its analysis suggests that companies have set targets that are too stretching or incentive rates that are too punitive. However, as evidenced in Chapter 1 (Risk and Financeability)[22] the overall package still represents a significant downward skew.

53. Ofwat stated in the DD that their results "*show that the overall package creates balanced risk outcomes on a company and sector basis".*[23] However, in the FD, Ofwat acknowledged that their PC/ODI package in the DD had been significantly miscalibrated. Ofwat estimated that *"[o]n the outcomes package … the midpoint for the median company at final determinations, compared to draft determinations, to be 182bps on regulated equity returns".*[24]

54. Ofwat's miscalibration is illustrated through a scenario which we have modelled under the assumption that we continue delivering our 2023/24 performance across each year in AMP8. This is a reasonable illustration as our botex allowances for each year in AMP8 are lower (by 18% in water and 29% in waste) than the level we spent in 2023/24, (i.e. we would need to deliver the same performance for less money). Under this scenario, we would receive a net penalty of -£330m or -1.66% RoRE[25].

55. Ofwat aimed for a balanced risk profile,[26] for example recognising that upper quartile targets were unachievable across the board for a single company, as per the CMA PR19 Redetermination decision.[27] At PR24, for some PCs (i.e. WSI), the approach of setting PCLs starting at levels more stretching than the industry outturn UQ is still taken and is not reflective of actual industry outturn performance.

56. Due to errors in Ofwat's risk analysis as outlined in Chapter 1: Risk and Financeability, Ofwat was unable to detect the significant risk attributed to ODIs. As outlined in our risk analysis, the ODIs

[20] For further detail see Chapter 1 (Risk and Financeability) and Chapter 2 (Base Costs).
[21] In the FD, Ofwat added or increased collars on internal and external sewer flooding, pollution incidents and biodiversity.
[22] For further detail see Chapter 1 (Risk and Financeability), Chapter 6.
[23] Ofwat, July 2024, PR24 Draft determinations: Delivering outcomes for customers and the environment, page 3, SOC-6-0011.
[24] Ofwat, December 2024, PR24 final determinations: Aligning risk and return – appendix, page 8, SOC-1-0008.
[25] Ofwat, January 2025, ODI payments calc_23_24 performance flatlined, worksheet "Output by company (with ASM)" cells AC261 and AC281, SOC-6-0015.
[26] Ofwat, December 2024, PR24 final determinations - Outcomes approach to risk modelling appendix, page 2, para 2, SOC-6-0016.
[27] The CMA's PR19 redetermination decision stated that UQ targets could not be achieved in all areas by a single company.

contribute to a negative P50 expected penalty for a notional like Southern Water company of -0.50%, a P10 of -1.56% and a P90 of 0.57% of RoRE. This is a combination of unachievable PCLs and the skew on individual ODIs. This is clear evidence that our package of ODIs remain miscalibrated and will lead to excessive downside risk.

57. A comprehensive review of the overall landscape is required to ensure that risk mitigations are reflective of a fair and symmetric risk regime.

3.1.3. Overarching Error 2: Exogenous factors not accounted for in FD

58. In many instances, Ofwat has not included from PC definitions exclusions for exogenous factors beyond management control in these definitions. As a result, companies are no longer allowed to exclude extreme weather events and other factors outside management control such as incidents under the Civil Contingencies Act.

59. At PR14 several of Ofwat's PC definitions (e.g. WSI and Water Asset Health) had specific exclusions for extreme weather events.[28] This helped to mitigate some of the issues outlined below. However, since removing such exclusions in PR19, volatility in companies' performance has significantly increased (noting WSI sector performance). This indicates that these factors have contributed to deteriorating performance. Repeating this approach at PR24 is an error which the CMA should correct.

60. Ofwat's position does not align to Defra's position. Defra recently consulted on the Guaranteed Service Standards (**GSS**), which apply to several of the same incidents covered under PCs, such as water supply interruptions. In its summary of responses to the consultation, Defra noted the importance of taking exogenous factors into account in the GSS:

> "*However, it is also important to appreciate it would be unreasonable to require companies to make payments to all affected customers in some genuinely extreme circumstances. These are circumstances a company could not have predicted or possibly mitigated against*."[29]

61. Ofwat's removal of the exclusions for exogenous factors is also inconsistent with regulatory precedent. For example, Ofgem has an exclusion for extreme weather events on its supply interruptions metric.[30] This is defined as an interruption greater than a set time amount rather than trying to define what is classified as extreme weather. In contrast, Ofwat's PC for WSI includes no such exclusion for extreme weather events and companies must bear all exogenous risk. We provide additional examples of exclusions for exogenous factors in other regulatory regimes in Table 2 below.

[28] Ofwat, December 2014, Setting price controls for 2015-20: Final price control determination notice: company-specific appendix – Southern Water, SOC-6-0017.
[29] Gov.uk, December 2024, DEFRA - Consultation outcome - Summary of responses and government response, SOC-6-0018.
[30] Ofgem, December 2020, RIIO-ED2 Methodology Decision: Annex 1 - Delivering value for money services for consumers, Page 69, SOC-6-0019.

Table 2: Example of exclusions in place in other regulated sectors

Sector	Regulator	Exclusion	Reference
Energy	Ofgem	Extreme weather events from its supply interruptions metric	* RIIO-ED2 Methodology Decision: Annex 1 - Delivering value for money services for consumers. P 69
Energy	AER (Australian energy regulator)	Adjustments for extreme weather events	*Electricity Network Performance Report 2020. Australian Energy Regulator. p32-33

62. The failure to exclude exogenous factors under the PC definitions is not in the interests of consumers. Achieving the level of resilience required to withstand these extreme events is not feasible it would require a significant increase in allowances thus lead to larger bill increases, making customer bills more unaffordable.

63. Specifically, by not allowing for certain exclusions in the PC definitions, Ofwat creates the following risks:

i. **Distortion of certain performance metrics**: Companies' performance could appear worse than it actually is. This could lead to unwarranted penalties or a failure to reward the company for good performance outside of these extreme events. This can distort companies' long-term planning and decision-making, given that companies may focus on mitigating extreme events that are statistically infrequent, rather than optimising day-to-day operations.

ii. **Negative financial consequences**: Penalties and rewards under the ODI regime have financial consequences for water companies. For example, in a scenario where there is a period of extreme rainfall that directly affects performance, companies might build up additional penalties. This could result in a misalignment between the incentives created by the regime (as such extreme weather events are beyond management control and therefore the company cannot be 'incentivised' to prevent them) and the actual costs or benefits incurred by the company.

iii. **Miscalibrating PCLs and ODIs leads to a negative cycle**: A PC which does not account for exogenous factors may needlessly contribute to an economic shock that may challenge a company's financial resilience. This may lead to a 'doom loop' as discussed in the background chapter where companies are subject to additional penalties which they cannot control. This could lead to reduced funds being available for investment which limits our ability to fix the underlying structural problems and lead to further penalties.

iv. **Undermined customer trust and perception**: Customers hold water companies accountable for service quality. However, extreme events can lead to temporary service failures (e.g., WSI) that are beyond the company's control. Under the ODI regime, such service issues might lead to penalties, which may not be fully understood by customers who are unaware of the underlying cause (e.g., severe weather or infrastructure damage).

64. Climate change is increasing the frequency and severity of extreme weather events, a trend that is projected to persist.[31] The current regulatory framework fails to adequately account for this evolving risk, which could undermine both necessary investment and customer satisfaction.

65. We outline in Section 4 which PCs this overarching error has an impact on and the subsequent remedies.

3.1.4. Overarching Error 3: Calibration errors

66. In the FD, there are several specific calibration errors which will have a negative impact on our business. They centre around the following areas:

I. ODI rate errors

67. The overall calibration of ODI penalties is excessive, unreasonable and downwardly skewed. Based on actual company performance from AMP7, the RoRE implication of the choice of ODI rates, before the impact of adjustment mechanisms is -0.50% at the P50, as described in Chapter 1 (Risk and Financeability) for the SWS-like notional company.

68. Ofwat's top-down approach to setting ODI rates includes calculating a 'likely performance range', which uses historical deviations of actual performance from the PCL. For each PC, Ofwat then calculated the P10, P90 of historical deviations and selected the larger of the two measures (except for new PCs). For these, Ofwat estimated 'proxy PCLs' to estimate historical deviations[32]. There are fundamental flaws with the P10/P90 data range, and the estimation technique used to find synthetic PCLs Ofwat use for certain PCs (mostly new PCs for PR24). Proxy PCLs are used where there is no historical precedent for performance. They create an artificial performance range which then feeds into the ODI rate calibration. This approach drives the calculation of more punitive ODI rates. This is set out in the ODI rate error for Storm Overflows below. In addition, the extra year of outturn data available at the FD compared with the DD had a material impact on ODI rates, which shows the sensitivity of using this methodology. We set out further arguments on this miscalibration in Section 4.

69. Ofwat's approach to setting ODI rates used an arbitrary starting allocation of risk based on a 0.5% return on regulated equity (% RoRE). There was no basis for this allocation of risk. This represents the equity at risk for each common PC. This is not based on customer preferences, but on the mid-point of theoretical payments from PR19 PCs. This resulted in a disproportionate asymmetric downside risk and does not reflect our customers' priorities.

70. Ofwat then adjusted this 0.5% RoRE allocation within a 0.4% - 0.6% RoRE range, based on the UK Government's strategic priorities[33], where a stronger priority was given a 0.1% increase in RoRE. This was not based on individual company research. It resulted in an asymmetric adjustment upwards with 9 (out of 16) PCs adjusted up to 0.6% RoRE and only 2 (out of 16) PCs adjusted down to 0.4%. There is no evidence to support the magnitude or the direction of this adjustment.

[31] Climate change committee, June 2021, Independent Assessment of UK Climate Risk, page 46, para 1, SOC-6-0020.
[32] Ofwat, December 2024, PR24 final determinations - Outcomes approach to risk modelling appendix, page 6, SOC-6-0016.
[33] Ofwat, July 2024, PR24 Draft determinations: Delivering outcomes for customers and the environment, page 24, SOC-6-0011.

71. Ofwat has also failed to take into account that customer priorities vary across companies. For example, our customers consider external sewer flooding to be an 'average' priority.[34] However, Ofwat adjusted the RoRE allocation up to 0.6% RoRE, in clear contrast to our customers' priorities.

72. We outline in Section 4 which PCs have specific ODI calibration errors and outline the remedies for each.

II. Performance Commitment Levels (PCLs) errors

73. PCLs are the target levels set against each PC for AMP8.

74. Ofwat recalibrated many PCLs between its DD and in the FD after recognising that its proposed PCLs were too stretching and would place undue risk on the sector. Ofwat reference this change in approach having stated in the FD that "*We do so by putting greater emphasis on recent performance levels and moving away from the default position of adopting PR19 performance commitment levels*" .[35] This change in approach is more aligned to a starting point that is achievable, but it is still based on a forecast. The CMA should consider actual 2024/25 performance when setting the baseline.

75. However, errors still remain, we are concerned about the achievability of some of the PCLs and the implied risk that they place on the company. Several PCLs for which there remains a high, stretch across the sector (e.g. Total Pollution Incidents, Storm Overflows and WSI) and, more generally, the PCLs are stretching relative to AMP7 levels of performance. Even though all but one company (Yorkshire Water -1%) are overspending their Totex allowances for AMP7[36], while not achieving the performance targets set out in AMP7.

76. Climate change and severe weather will also change the baseline performance over AMP8, and investment may not be sufficient to achieve the Business Plan forecasts originally submitted in light of new information and Ofwat set PCLs more stretching than Business Plan levels. This is particularly relevant for the pollution incidents and storm overflows PC, and we outline this impact in Section 4.

77. We will set out further arguments in Section 4.

III. Caps/Collars/Deadbands

78. Caps (i.e. limits on outperformance payments for an ODI), collars (i.e. limits on underperformance payments for an ODI) and deadbands (i.e. specified range of performance levels where the ODI underperformance or outperformance payment is zero) are risk mitigation measures used to reduce risk borne on companies and customers as a result of ODIs.

79. In the FD, Ofwat included caps and collars on most PCs in contrast to DD where there was limited use of caps and collars. However, the ODIs package as a whole is still miscalibrated. There are still several PCs where there is no individual collar. In some instances, there is a cap but no symmetrical collar which adds to the asymmetric risk profile.

80. Ofwat decided not to include collars on five ODIs, namely Serious Pollutions, Discharge Permit Compliance, Leakage, CRI and Water Quality Contacts:

[34] Customer priorities research
[35] Ofwat, December 2024, PR24 Final determinations: Delivering outcomes for customers and the environment, SOC-6-0029.
[36] Ofwat, September 2024, Water company performance report 2023/24 data, SOC-6-0005.

- For Leakage, a 1% cap was introduced but no collar. No other PC has a cap and no collar. This, by design, is an unsymmetrical incentive.
- Water Quality Contacts also has no collar. Whilst other service-related measures (i.e. WSI) have a collar. For example, if we were to have a large water incident, the current regime would cap our underperformance on WSI, but for water quality contacts we would be exposed to significant downside risk;
- For Discharge Permit Compliance external factors will impact the future performance such as the inclusion of Dry Weather Flow (**DWF**) limits—are outside management's control.

Section 4 outlines why a collar should be introduced on the above metrics to remedy the open-ended downward risk exposure posed. Section 4 also explains our arguments behind introducing a collar on CRI and Serious Pollutions.

81. To highlight the overall miscalibration on a wholesale basis, there are scenarios where the upside of performance ranges are not achievable due to natural limits (certain PCs have a maximum performance threshold such as zero storm overflow average spills, zero minutes of supply lost, zero % of unplanned outage and zero sewer collapses). Based on the current framework Ofwat uses for setting caps, it is impossible for us to achieve the 0.5% RoRE cap level for these PCs, as we would need to achieve negative performance (past the natural limit on outperformance).

82. This was highlighted in Grant Thornton's independent review into Ofwat's approach to ODIs where they outlined some issues with Ofwat's approach:

> "*Performance ranges for some PCs are not achievable on the upside due to natural limits. Some PCs are penalty only, and some have a 'natural limit' to performance (e.g. zero minutes of unplanned outage). Ofwat does not account for these limits when setting its initial unit rates.*"[37]

83. The fact that there are scenarios where we cannot achieve the maximum reward based on where the cap is set is unreasonable and feeds into the wider miscalibration of risk.

IV. Overall risk mitigation measures

84. Ofwat attempted to address the significant imbalance of risk and return ahead of the FD by including the Outturn Adjustment Mechanism (**OAM**) alongside the Aggregate Sharing Mechanism (**ASM**):

- The ASM protects customers and companies from excessive aggregate payments by reducing the additional payments beyond pre-defined thresholds. The first trigger for the mechanism is +/-3% RoRE, where additional net payments are shared 50:50 between the company and the customer. The second trigger for the mechanism is +/-5% RoRE, where additional payments are shared 10:90 (with the company keeping 10% of any reward above this point and only having to pay 10% of any penalty). These triggers are excessively wide and, based on historical sector-wider performance, are rarely met. This limits the ASM's effectiveness as a risk mitigation tool. Further evidence on the ASM's ineffectiveness is provided in Chapter 1: Risk and Financeability.

- The OAM is a way to mitigate sector wide risk. It rebases all companies ODI reward/penalties based on the median firms' annual net ODI reward or penalty performance.

[37] Grant Thornton, February 2024, A review of Ofwat's PR24 approach to ODIs, SOC-6-0021.

This means that the median company in the industry will end up with a balanced risk and reward package for ODIs.

85. Given the importance of the OAM, it is concerning that it was consulted on so late in the regulatory process, with the consultation occurring only two months before the FD was issued.[38] This late consultation is part of a wider pattern of frequent changes in methodology throughout the PR24 process, including in respect of setting ODIs, as we have highlighted in this chapter. The lack of regulatory consistency and the repeated shifts in approach undermine business planning, creating significant uncertainty for the sector. At a time when clear and transparent regulation is crucial for stability, these fluctuations only add to the challenges faced by water companies.

86. In the FD, Ofwat introduced a deadband to the framework in which the mechanism OAM would only trigger when the median companies net ODI position was worth more (or less) than +/-50bps. Ofwat did not consult on this deadband.

87. Sector analysis using AMP7 data[39] suggests that a modest OAM adjustment would have been applied to both Wastewater PCs (+0.36%) and Water PCs (+0.59%). However, without the deadband, the adjustment would have been significantly higher, at +0.98% for Wastewater PCs and +2.11% for Water PCs.

88. The introduction of the +/-50bps deadband severely restricts the adjustment, undermining the intent of Ofwat's original proposal and keeps the asymmetric downside skew in the package of ODIs. The downside skew first needs to be solved at source as per our specific remedies and then removing the deadband to ensure the package is balanced throughout the AMP.

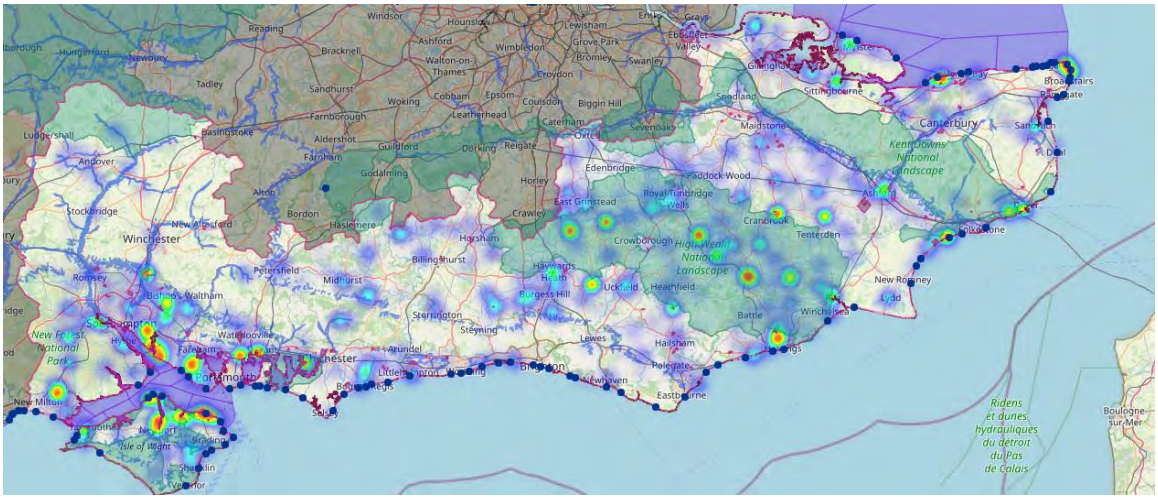
3.1.5. Overarching Error 4: Fundamentals of Southern Water are different from other companies: Applying a national policy result in unjust penalty

89. The characteristics of Southern Water differ significantly from other companies in the sector, which makes a one-size fits all approach to regulation inappropriate. Applying a national policy fails to recognise the unique circumstances and challenges faced by Southern Water. A failure to consider these differences can lead to penalties that are disproportionate and unjust on the basis that they disregard the specific needs and conditions of the company.

90. Southern Water's operational area presents unique challenges, including diverse geography, high population density and environmental sensitivities in protected areas. This includes vast Areas of Outstanding Natural Beauty (**AONB**), numerous chalk streams, shellfish waters and bathing water sites. These distinctive factors require a more tailored approach when setting certain PCLs/ODIs, which makes the application of a one-size-fits-all national policy inappropriate, as it fails to account for the specific risks faced by Southern Water compared to other companies

[38] Ofwat, October 2024, PR24: Consultation on outturn adjustment mechanism, SOC-6-0022.
[39] Refer to Southern Water, Historical Industry application of OAM_analysis , SOC-6-0037.

Figure 6: Presence of ecological characteristics in Southern Water's region and occurrence of pollution incidents in AMP7



91. KPMG's report[40] highlights that our wastewater region is found to have statistically significant higher exposure to the assessed ecological factors (Shellfish waters, bathing water, chalk stream and AONB exposure) than the sector average. These areas are designated protected regions and may therefore be subject to stricter discharge requirements which could increase the likelihood of reportable pollution incidents. The Environment Agency's Common Incident Classification Scheme states that any damage to a statutorily protected site may be classified as at least a category 2 pollution incident.[41]

Table 3: Southern Water's exposure to ecological and demographic factors vs sector average

	% AONB	% Chalk stream	% Shellfish water	% Bathing water	Population density
Southern Water	33.1%	2.2%	7.0%	0.2%	1.1
Sector average	15.5%	1.0%	1.6%	0.1%	1.0
p value	0.00027*	0.00321*	0.00000*	0.00178*	0.36770

92. KPMG's report uses cross-sectional multi-variate regression analysis and supports the hypothesis that exposure to these ecological characteristics increases pollution incidents. This suggests exposure to the assessed explanatory variables all contribute to increased pollution incidents. Therefore, our larger exposure to these factors relative to the sector may have increased the occurrence of pollution incidents historically.

93. For a set of like-for-like asset failures, Southern Water would cause more pollutions which are of a higher grade as compared to other companies whose receiving waters are less environmentally

[40] KPMG, March 2025, Impact of exogenous risk factors on wastewater ODI performance, page 17, SOC-1-0004.
[41] Environment Agency, September 2016, Incidents and their classification: the Common Incident Classification Scheme (CICS), SOC-6-0023.

sensitive. This makes it intrinsically harder for us to meet common performance metrics impacted by these ecological characteristics.

94. The CMA should account for these unique factors when calibrating the PCL/ODI package. We set out how the CMA should do so in Section 4 below.

4. Mapping of the errors to PCs and Remedies (Request to the CMA)

95. Overall, Ofwat's approach to calibrating the PC/ODI package is inconsistent with its statutory duties, including the primary duties to further the consumer objective and to ensure that water companies can finance the proper carrying out of their statutory functions. The current package proposed in the FD results in:

- An overall RoRE risk exposure which is too great and with a large downward skew
- Insufficient risk mitigation measures (caps, collars and deadbands);
- Errors in PC definitions (i.e. not including exclusions for certain PCs);
- Errors in Ofwat's approach to setting PCLs; and
- Errors in Ofwat's approach to setting ODI rates.

96. Ofwat's PCs/ODIs package fails to take a coherent, evidence-based approach, which imposes challenging but achievable targets grounded in strong evidence that strike a fair balance of risk and reward. Instead, Ofwat's micro-level interventions on certain PCs/ODIs have lost sight of this objective and disregarded the broader context and ultimately undermine the overall risk balance.

97. Having outlined **the overarching errors in Section 3 above, this Section addresses specific errors in each identified PC, and we provide our proposed remedy in respect of each of these.**

98. Once all remedies have been corrected this will give a much more balanced package, Table 4 below shows the change in the P10, P50 and P90 performance for a notional company like Southern Water. The details of the risk modelling to determine these values are set out in the risk return and financeability chapter.

Table 4: Simulated Outcome of Risk

	P10	P50	P90
Our risk analysis from FD	-1.56%	-0.50%	0.57%
Our risk analysis post implementation of remedies	-0.83%	-0.16%	0.56%

*The above is derived from KPMG's risk analysis on a notional company, like Southern Water. Bathing water quality, storm overflows and BR-MeX are not included in their analysis

Water Performance Commitments

4.1 Water Supply Interruptions (WSI)

(i) Definition

99. This PC is designed to incentivise the company to minimise the number and duration of supply interruptions. It is measured as the average number of minutes lost per customer for the whole customer base for interruptions that lasted three hours or more.

Our errors identified for WSI fall under the overarching errors, "calibration errors" and "exogenous factors". Both the PCL and ODI rate for WSI are subject to errors.

(ii) PCL target

100. In the FD, Ofwat set a sector-wide flat PCL of 00:05:00 per property for each year of AMP8, this was set as a continuation from the current sector wide 2024/25 target of 00:05:00.

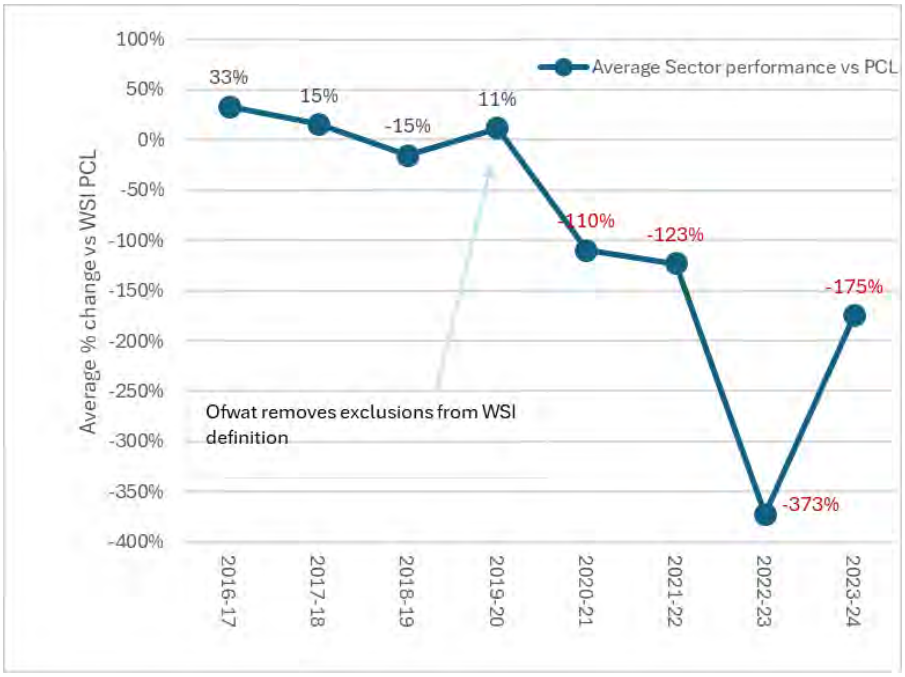
101. This target does not reflect the achievability of the industry:

- In 2023/24 only 4 out of 17 companies managed to achieve the PR19 PCL of 00:05:23 per property, these were Affinity Water, Sutton and East Surry Water, South Staffordshire Water and Portsmouth Water. Each of these companies are small Water Only Companies (WOCs). This means that 76% of the sector, including all WASCs, did not meet this target based on latest outturn data representing 89% of customers in England and Wales;

- It does not take into account the effects of severe weather events, which are outside of management control. This exclusion was removed in the PR19 definition and corresponds with a deterioration in sector performance. Figure 7 below shows the deterioration in sector performance against the WSI PCL post 2019-20 where Ofwat removed the exclusion for extreme weather events; and

- It does not consider underlying differences between companies, such as the design of the water network and historical funding, which have a material effect on current supply interruptions performance.

Figure 7: Average historical WSI performance across the sector



102. Ofwat has set the PCL based on the PR19 target of 00:05:00. This target assumes that companies are meeting the PCLs in PR19. In comparison, customer minutes lost due to interruptions in other related sectors including gas (11 minutes)[42] and electricity (35 minutes)[43] are much higher. The justification for 00:05:00 needs to be reassessed. It does not give a fair balance of risk and reward and is not based on outturn performance given current cost allowances, as discussed in the overarching Error 3 above.

103. The PCL target for 2025/26 should represent the median outturn performance (00:09:18 for 2023/24 data), with the 2030 target set at the industry actual UQ (00:05:32) with a straight-line trend between the two.

(iii) ODI rate

104. In the FD, Ofwat set an ODI rate of 0.536, which is 84% higher than the PR19 rate. This was one of the only PCs along with three others (out of 22) in which the ODI rate in the FD was higher than in the DD. Ofwat also set a -1% RoRE collar. As noted below, this does not align with customer preferences.

105. Ofwat set this ODI using probability variation of the P10 and P90 levels of performance using data back to PR14.

[42] Ofgem, April 2022, RIIO-2 Regulatory Financial Performance Reporting – Regulatory Instructions and Guidance Version 1.0, SOC-6-0024.
[43] Ofgem, November 2024, ED3 Framework Consultation, page 71, SOC-6-0025.

106. The data Ofwat used from PR14 includes a critical change in PC definition from PR19. In PR14, Ofwat stated in its PC definition "*The impact of severe weather conditions will be taken into account*".[44]

107. In PR19, these exclusions were removed and corresponded with an apparent deterioration in performance from the sector. Despite this material change in definition, Ofwat has continued to use the full dataset covering 2015 to 2024 to set its performance range in its ODI rate calibration. Performance at PR14 was less volatile due to these exclusions.

108. Using data from the PR19 period only would ensure the variations in performance are consistent with the current definition of water supply interruptions. This increases the P10/P90 range from 342% to 599%[45] and should also be updated for 2024/25 actuals once those are available. The net impact of this would reduce the ODI rate by a factor of 1.6x.[46]

109. The collar does not align with Ofwat's methodology at PR24 to give balanced incentives[47], as it is proposing a wider collar due to the volatility of the measure without consideration to the wider impact of creating a more unbalanced risk and reward package. Further, it does not consider the Guaranteed Standards Scheme where water companies are required to compensate customers when failing certain standards. This includes water supply interruptions greater than 12 hours. This risks distorting Ofwat's intended impacts of this measure. We request that the CMA remedies this by aligning the collar with most other PCs at -0.5% RoRE.

(iv) Remedies

- To remedy the P10/P90 miscalibration of the performance range, the CMA should use PR19 data onwards to set the **ODI rate at 0.329;**[48]
- The CMA should align with the rest of the PCs given lack of detailed justification for wider collar and **set collar at -0.5% RoRE**; and
- To remedy the PCL miscalibration, the CMA should **set the PCL to levels set out in** Table 5 **below.**[49]

Table 5: Remedies for WSI

	2025/26	2026/27	2027/28	2028/29	2029/30
Ofwat FD target	00:05:00	00:05:00	00:05:00	00:05:00	00:05:00
Remedy PCL	00:09:18	00:08:21	00:07:25	00:06:28	00:05:32
Ofwat FD collar (-1% RoRE)	00:25:27	00:25:27	00:25:27	00:25:27	00:25:27
Remedy collar (-0.5% RoRE)*	00:25:57	00:25:01	00:24:04	00:23:08	00:22:11

[44] Ofwat, December 2014, Setting price controls for 2015-20: Final price control determination notice: company-specific appendix – Southern Water, page 155, SOC-6-0017.
[45] Refer to Southern Water, CMA SoC_PCs_ODIs_supporting analysis, worksheet "WSI", SOC-6-0026.
[46] Refer to Southern Water, CMA SoC_PCs_ODIs_supporting analysis, worksheet "WSI", SOC-6-0026.
[47] Ofwat, December 2022, PR24 Final Methodology – Appendix 10 Aligning risk and return, SOC-1-0007.
[48] Refer to Southern Water, CMA SoC_PCs_ODIs_supporting analysis, worksheet "WSI", SOC-6-0026.
[49] Refer to Southern Water, CMA SoC_PCs_ODIs_supporting analysis, worksheet "WSI", SOC-6-0026.

*Collar calculations based on remedy ODI rate

	Ofwat FD	Remedy
P10 / P90 performance range	342%	599%
ODI	0.536	0.329

4.1.1. Compliance Risk Index

(i) Definition

110. The Compliance Risk Index (**CRI**) PC is designed to incentivise full compliance with our statutory obligations related to treated water compliance and limit water quality failures. Lowering our CRI score will promote customer confidence that our water is clean and safe to drink. The detailed definition is set by the Drinking Water Inspectorate (**DWI**).[50] This is an underperformance only PC which means payments for outperformance are not available.

111. ***Our errors identified for CRI fall under the overarching error, 'calibration errors'. Ofwat erred in setting the deadband and not applying an underperformance collar.***

(ii) PCL Target

112. In the FD, Ofwat set our performance target at 0.0 with a common underperformance deadband on a glidepath from 1.83 to 1.0 for each year of AMP8. This is more stretching than the 2023/24 industry median performance of 3.57 and substantially more stretching than the average for this year of 5.15.

113. We have a significantly larger number of our assets under DWI investigation notices than all other companies. These notices have agreed completion dates with the DWI in 2030. This means our CRI score remains inflated through the assessment score multiplier until these notices are removed, as these will not be downgraded or reassessed by the DWI until the work is complete. The notices are expected to last for the full duration of AMP8.

114. Our AMP8 business plan includes investment schemes to address the DWI's concerns that led to the DWI notices issues. While these investments are underway, we should not be further penalised through a PC.

115. We submit that the CMA should adopt a wider deadband. This is essential to addressing the issue discussed above, which results in an inflated CRI score due to the assessment score multiplier. Adopting the deadband starting at 3.33 and reducing to 2.0 by 2029/30 will correct for this distortion and stop us from being unduly penalised as we undertake our investment plans.

(iii) Underperformance collar

116. In the FD, Ofwat set an ODI rate of 0.708 with no collar on underperformance.

[50] DWI, August 2018, Compliance risk index, SOC-6-0027.

117. Given that CRI is a compliance related PC, there are only penalty payments and no possibility for outperformance. Ofwat has not included a collar for this PC. This may expose us to additional downside risk outside of management control that should be mitigated through the inclusion of a collar. This fits into our broader error "downward risk exposure" highlighted in Section 4.1.6.

(iv) Remedies

118. To **remedy** the inflated assessment score in the CRI score parameter, the CMA should update our deadband **as set out in** Table 6 **below.**

119. To **remedy** the risk of the DWI changing its definition which is outside of management control, the CMA should add in a **collar at -0.5% RoRE[51].**

Table 6: Our proposed deadband and collar for CRI

	2025/26	2026/27	2027/28	2028/29	2029/30
Our performance target	0.00	0.00	0.00	0.00	0.00
Ofwat FD deadband	1.83	1.67	1.50	1.25	1.00
Remedy deadband	3.33	3.23	3.02	2.62	2.00
Remedy Collar (-0.5% RoRE)	11.07	10.97	10.76	10.36	9.74

Wastewater Performance Commitments

4.1.2. Total pollution incidents

(i) Definition

120. The total number of pollution incidents PC is reported in number of incidents and normalised by 10,000 km of sewer length. It applies only to our wastewater activities as it measures the pollution incidents from discharges or escapes of contaminants from our sewerage assets affecting the environment. It includes category 1,2 and 3 incidents as defined in the Environmental Agency's WaSC Environmental Performance Assessment (**EPA**) methodology.[52]

***Our errors identified for Total Pollutions fall under the calibration errors and exogenous factors overarching errors*– the *PCL and* ODI rate for total pollution incidents are subject to errors**.

(ii) PCL Target

121. In the FD, Ofwat sets a common target for total pollution incidents across the industry for AMP8, which stretches to a level of performance that is close to the projected industry UQ.

[51] Refer to Southern Water, CMA SoC_PCs_ODIs_supporting analysis, worksheet "CRI", SOC-6-0026.
[52] Environment Agency, February 2024, Water and sewerage company Environmental Performance Assessment (EPA) methodology (version 11) for 2021 to 2025, SOC-6-0028.

122. Ofwat has set the industry a PCL target of 25 incidents per 10,000 km of sewer length for the year 2025/26 down to 18.63 incidents per 10,000 km of sewer length in 2029/30. This is a 30% improvement over the five years.

123. This target has not been correctly calibrated. In 2023/24, the industry performance had a sector median (excluding Hafren Dyfrdwy) being 32.54 and an industry UQ of 28.33. Ofwat's proposed PCL for 2025/26 is 25.02. Based on 2023/24 performance, all WaSCs would face an ODI penalty.

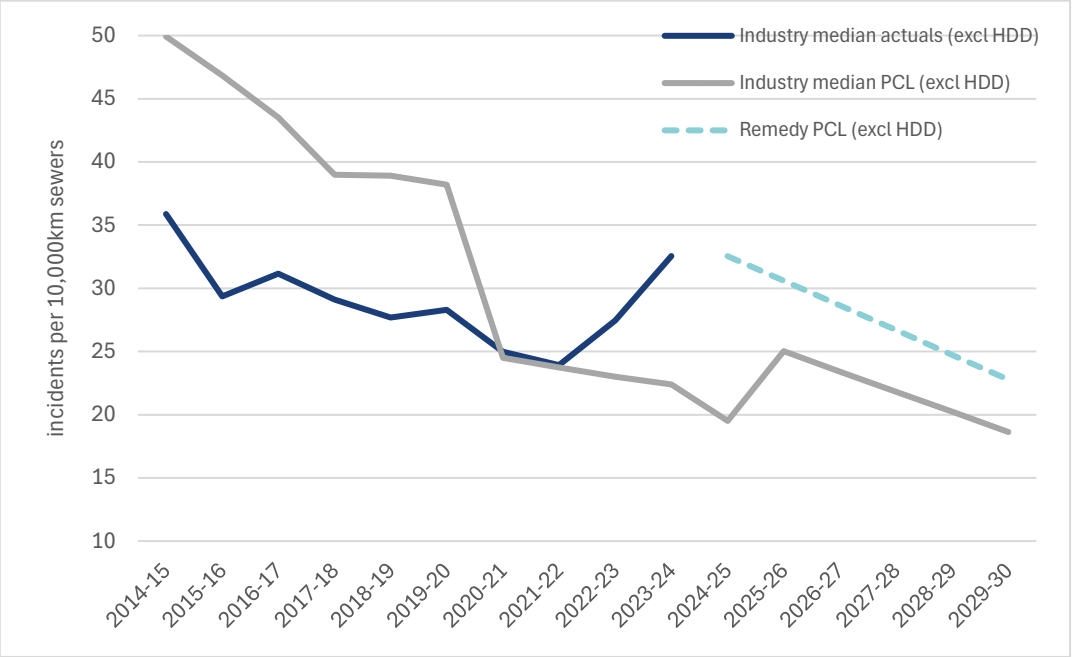
124. The AMP8 PC baseline should be adjusted to reflect the most up to date levels of performance available. We have developed a more up to date forecast using the latest data for 2023-24 reporting. The reported industry data for 2023-24 and our performance to date for 2024-25 has shown that this emerging trend is continuing.

125. A more reasonable and balanced approach would be for Ofwat to establish a common 2024/25 baseline using the median of the 2023/24 outturn data or the median of 2024/25 data if available. The changes to the reporting methodology and technology used to capture data (Event Duration Monitoring (**EDM**)), has led to an increase in recorded pollution incidents which justifies a resetting of the 2024-25 baseline. This approach would remedy the issue of using a sample size that fails to accurately reflect the sector's actual outturn performance. As this data represents a more accurate reflection of actual performance and an industry correction, it would be more appropriate for the 2024/25 baseline.

126. By using a median of 32.54 as the 2024/25 baseline and applying a 30% stretch (as per Ofwat's methodology), the 2029/30 PCL would be set at 22.78. This target is far below the current 2023/24 UQ of 28.33 performance of the sector. The 2025/26 PCL would be set at 30.59, placing it directly between the average industry mean and UQ performance.

127. This method more accurately reflects actual performance while still representing a significant stretch to achieve performance below the industry's UQ (28.33) by 2029/30.

Figure 8: Total pollutions – industry trend and our proposed remedy[53]



(iii) ODI rate

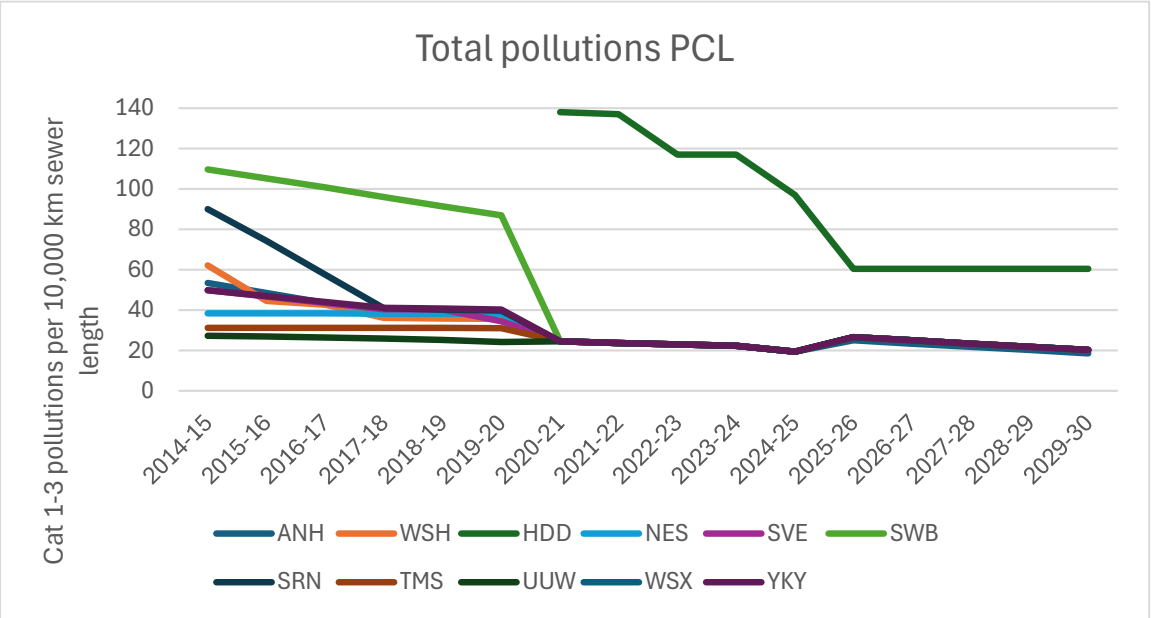
128. The FD set an ODI rate of 0.984 and an underperformance collar at -0.75% RoRE.

129. At PR14, companies were set highly bespoke targets tailored to their own starting position and improvement trajectories. However, at PR19, Ofwat harmonised targets across companies (with the exception of Hafren Dyfrdwy (HDD)) as shown on Figure 9 below. As a result, the deviation of company performance vs PCL at PR14 was much lower as compared to PR19. The PR19 approach is aligned to the ex-ante targeting approach used at PR24 and is a better representation of the likely P10/P90 performance range of the industry.

130. By focusing on the PR19 timeseries, the P10/P90 range increases from 66% to 284%[54], reducing the ODI rate in Ofwat's methodology by a factor of 2.6.[55]

[53] Southern Water, Total Pollutions_Storm Overflow_supporting graphs, SOC-6-0030.
[54] Refer to Southern Water, CMA SoC_PCs_ODIs_supporting analysis, worksheet "Total Pollutions", SOC-6-0026.
[55] Refer to Southern Water, CMA SoC_PCs_ODIs_supporting analysis, worksheet "Total Pollutions", SOC-6-0026.

Figure 9: Total Pollutions PCL



131. Climate patterns are becoming increasingly volatile, which means that pollution risk is arising from more frequent and severe storm events. KPMG's analysis[56] on simulating the implications of climate change for AMP8 (given the relationship between performance and weather) indicates underperformance by Southern Water against the FD target.[57] This indicates performance is highly affected by rainfall and unique ecological characteristics. Such factors are uncontrollable and should be accounted for when setting the targets.

132. This effect substantially increases the distribution of performance by 20-50% of the P10/P90 range. This further emphasises the need to recalibrate the PCL.

[56] KPMG, March 2025, Impact of exogenous risk factors on wastewater ODI performance, page 28-29, SOC-1-0004.
[57] KPMG, March 2025, Impact of exogenous risk factors on wastewater ODI performance, page 28-29, SOC-1-0004.

(iv) Remedy

- To remedy the P10/P90 miscalibration of the performance range, the CMA should use PR19 data onwards to set the **ODI rate at 0.379[58]; and**
- To remedy the PCL miscalibration, the CMA should **set the PCL to levels set out in** Table 7 **below[59].**

Table 7: Remedies for Total Pollutions

	Baseline	2025/26	2026/27	2027/28	2028/29	2029/30
Ofwat FD Target	26.61	25.02	23.42	21.82	20.23	18.63
Remedy PCL	32.54	30.59	28.64	26.69	24.73	22.78

	Ofwat FD	Remedy
P10 / P90 performance range	66%	284%
ODI	0.984	0.379

4.1.3. Serious pollution incidents

(i) PC definition

133. The serious pollution incidents PC is a new PC at PR24. It is reported in number of serious incidents resulting from discharges or escapes of contaminants from our sewerage assets or water supply assets affecting the water environment. It applies to all our water and wastewater activities.

134. ***Our errors identified for Serious Pollution Incidents fall under the calibration errors and exogenous factors identified in Section 3. This requires risk mitigation measures (introduction of a collar).***

(ii) Risk protections

135. In the FD, Ofwat set us a flat target of zero serious pollution incidents across AMP8. A target of zero serious pollution incidents across AMP8 for us means reducing from 13 serious pollution incidents in 2023/24 to 3 in 2024/25. However, Ofwat also assumes a 2024/25 baseline at zero. This is more ambitious than the baseline of 3 serious incidents that we forecast in the DD Response.

136. Ofwat set a common underperformance deadband of 1 incident. This is set at the UQ of 2023/24 outturn performance. In the FD, Ofwat set an ODI rate of 1.557 with no underperformance collar.

[58] Refer to Southern Water, CMA SoC_PCs_ODIs_supporting analysis, worksheet "Total Pollutions", SOC-6-0026.
[59] Refer to Southern Water, CMA SoC_PCs_ODIs_supporting analysis, worksheet "Total Pollutions", SOC-6-0026.

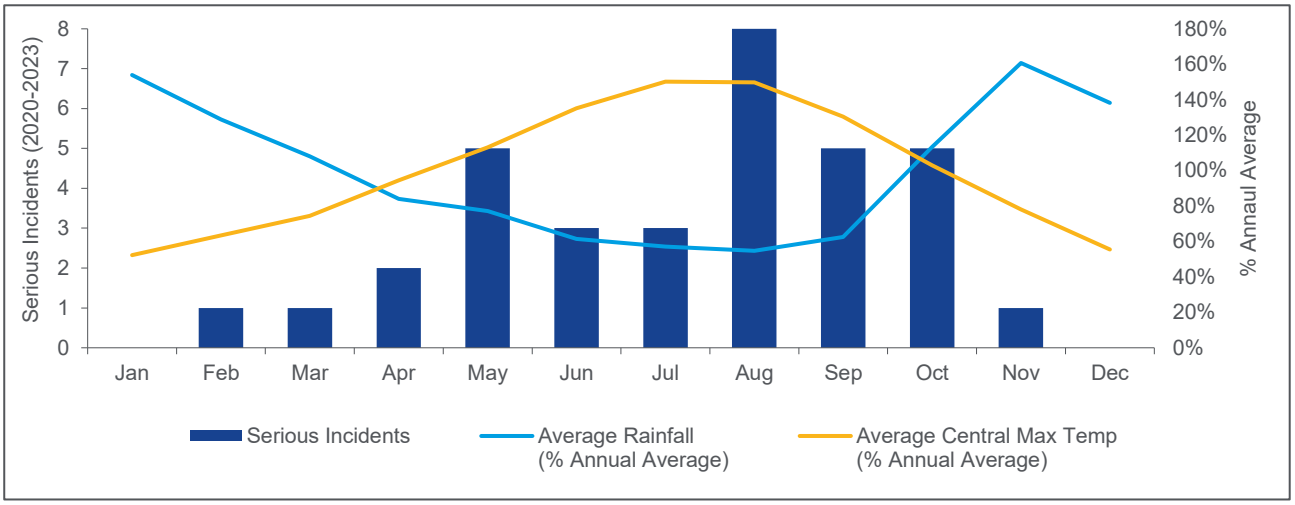
137. Our risk analysis has identified serious pollution risk as a key area of regulatory risk for AMP8 due to the:

- Correlation between temperature and number of incidents;
- Level of stretch in the targets; and
- High incentive rate.

138. In our DD Response[60], we highlighted the strong relationship between serious pollution incidents and temperature as set out in Figure 10. The analysis shows that that even with the caps and collars permitted by the FD, Serious Pollution incidents present an asymmetric downward skewed risk profile.

139. Evidence[61] indicates that drier conditions could also drive more serious pollution incidents. Because there is less water in the sewerage system, the content is more highly concentrated. When a discharge occurs, a more concentrated wastewater can enter a waterway which may also be experiencing lower than normal water levels due to dry conditions. As a result, any discharge has a greater impact and has a higher probability of being classified as a category 1 or 2 incident (serious pollution incident). This risk is expected to increase with the growing effects of climate change. The report[62] concludes from its simulation results that there is material underperformance for serious pollution incidents in both the base case (P50) and worst-case (P10) scenarios. Given that this risk is outside of management's control, it requires regulatory risk mitigation to ensure that a notionally efficient company operating in the South East of England can make the necessary investments to address these challenges, while avoiding excessive downside risk and penalties that is, in part, driven by exogeneous factors.

Figure 10: Serious Pollution Incidents by Month (Southern Water, 2020 - 2023) vs temperature and rainfall[63]



140. Given the risk factors outlined and the fact that this is a new performance commitment, a collar at 0.5% RoRE (equivalent to an average of 10 incidents per year across the AMP) is necessary to provide protection against unforeseen risks while addressing performance challenges.

[60] Southern Water, August 2024, SRN-DDR-012: Risk Appendix - Draft Determination Response, SOC-1-0003.
[61] KPMG, March 2025, Impact of exogenous risk factors on wastewater ODI performance, page 25, SOC-1-0004.
[62] KPMG, March 2025, Impact of exogenous risk factors on wastewater ODI performance, page 28, SOC-1-0004.
[63] Southern Water, August 2024, SRN-DDR-012: Risk Appendix - Draft Determination Response, page 14, SOC-1-0003

141. Ofwat also introduced collars to all other new PCs as set out in the PR24 Final Methodology[64]. Ofwat stated:

142. "*We continue to set the cap and collar at the standard level of +/-0.5% RoRE for new performance commitments as this offers sufficient protection against high levels of financial risk whilst maintaining a wide range where ODI payments apply to maintain incentives.*"[65]

143. Given the risks associated with serious pollution incidents and the fact this PC is new for PR24, the CMA should remedy this by aligning with Ofwat's approach for other new PCs and introduce a collar at -0.5% RoRE.

(iii) Remedy

144. To remedy the risks that stem from exogenous drivers (i.e. increasing climate risk) given exclusions are not considered in the PC definition, we request that the CMA introduces an underperformance collar of -0.5% RoRE[66].

Table 8: Remedies for Serious Pollutions

	2025/26	2026/27	2027/28	2028/29	2029/30
Ofwat FD performance	0.0	0.0	0.0	0.0	0.0
Ofwat FD deadband	1.0	1.0	1.0	1.0	1.0
Remedy (0.5% collar)	10.0	10.0	10.0	10.0	10.0

4.1.4. Storm overflows

(i) PC definition

145. Storm overflows is a new PC at PR24. It incentivises a reduction in the adverse effects of discharges from our storm overflows on public health and the environment. It is measured as the average number of monitored and unmonitored spills per storm overflow. The unmonitored storm overflow adjustment is calculated as the percentage of the year the storm overflow was unmonitored times 100 spills.

146. *The errors in respect of Storm Overflows fall under the* ***calibration errors and exogenous factors overarching errors*** *identified in Section 3.*

(ii) PCL

147. In the FD, Ofwat set different PCLs for each company despite this being an industry wide issue. We have been given the frontier target of 17.99 in 2025/26 and 13.71 in 29/30 versus an industry median target of 20.0 in 2025/26 and 17.0 in 2029/30[67]. It is not justified that Southern Water should have a target 20% tougher than the rest of the industry.

148. Ofwat has miscalibrated the PCL target through setting a target of 20 spills per overflow from 2025 (based on the Defra target[68]) this has not considered recent real-world information. Ofwat's target setting did not consider the impact of recent outturn data driven by exogenous factors on

[64]Ofwat, July 2024, PR24 Draft determinations: Delivering outcomes for customers and the environment, page 32, SOC-6-0011.
[65]Ofwat, July 2024, PR24 Draft determinations: Delivering outcomes for customers and the environment, page 32, SOC-6-0011.
[66] Refer to Southern Water, CMA SoC_PCs_ODIs_supporting analysis, worksheet "Serious Pollutions", SOC-6-0026.
[67] Refer to Southern Water, CMA SoC_PCs_ODIs_supporting analysis, worksheet "Storm Overflows", SOC-6-0026.
[68] DEFRA, September 2023, Storm Overflows Discharge Reduction Plan, SOC-6-0038.

performance e.g. 2023/24 was one of the wettest on record which led to a deterioration in storm overflow performance across the sector.

149. Ofwat has applied top-down stretches to the targets proposed by companies:

- Firstly, Ofwat decided to set a 20% stretch to the 2029/30 target because our business plan did not propose any improvements from base. However, improvements to storm overflows is driven through enhancement expenditure as per the £1,017m enhancement allowance Ofwat provided for storm overflows in AMP8.

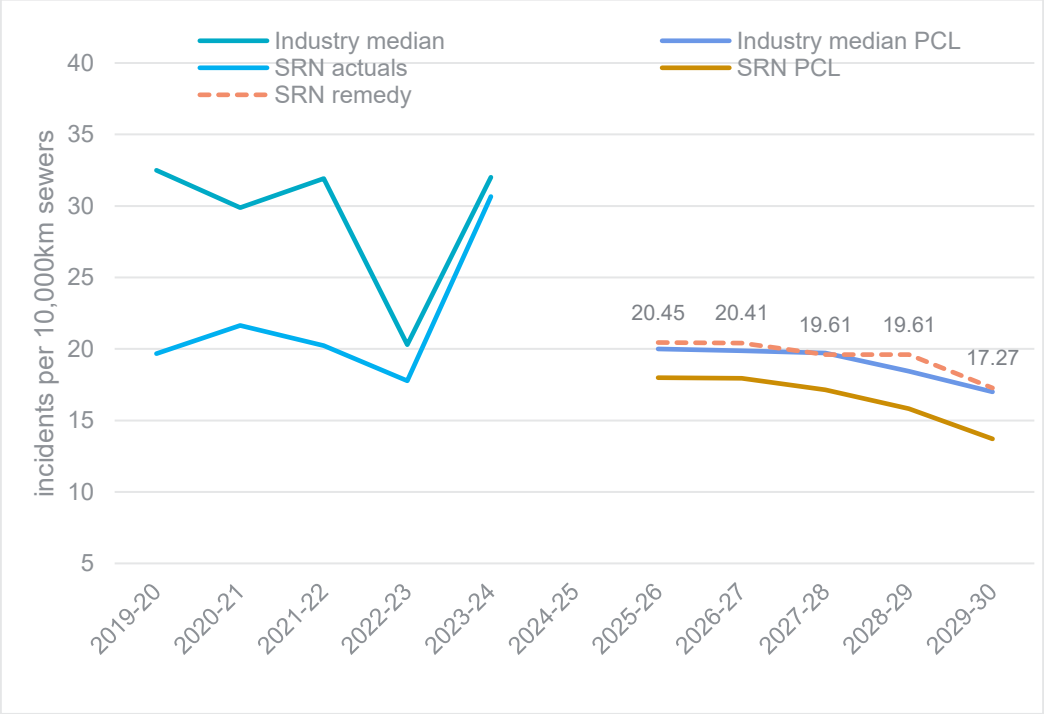
- Secondly, Ofwat challenged the 2028/29 target to a specific intervention. In this intervention, Ofwat has applied an additional level of stretch to our 2028/29 target in order to deliver benefits earlier. Improvements in storm overflows are linked to WINEP enhancement investment schemes with delivery dates agreed with the EA. Many schemes are due to be delivered towards the end of AMP8. Performance improvements will therefore not be realised until the back end of AMP8. Ofwat's PCL targets are inconsistent with this and assume that performance will follow a smooth improvement profile across AMP8. Ofwat has not appropriately factored in the agreed EA delivery dates.

- Finally, Ofwat asked companies to assume 100% uptime in their PR24 Final Methodology submission table guidance[69]. All other companies (except Southern Water, Thames Water and Yorkshire Water) reported this figure. We reported 97%, which corresponds to an adjustment of 3 unmonitored overflows. This served to reduce the PCL Ofwat applied to us. Given the request from Ofwat, this should be adjusted to 100% uptime and zero unmonitored overflows[70] to align with the rest of the sector. Adjusting for this error in Ofwat's PCL model leads to the recalibrated PCL presented below at Figure 11.

150. To remedy the mistake and align the PCL with the rest of the sector, our 2025/26 PCL should be set to 20.45 with the 2029/30 set to 17.27 (aligned with the median for rest of sector).

[69] Ofwat, August 2023, PR24 Final Methodology submission table guidance – section 1: Outcomes, SOC-6-0031.
[70] Refer to Southern Water, CMA SoC_PCs_ODIs_supporting analysis, worksheet "Storm Overflows" cells Z184:AD184 and AM184:AQ184, SOC-6-0026.

Figure 11: Storm Overflows – Remedy for PCL error[71]



(iii) ODI rate

151. In the FD, Ofwat set an ODI rate of 0.833.

152. Storm overflows is a new PC in AMP8; therefore, few historical data points exist to use in setting the ODI rate. To calibrate the ODI rate, Ofwat has synthetically recreated a historical target based on industry outturn performance in each year and then compared company deviations to it to get a P10/P90 range. Using this approach the current P10/P90 range that Ofwat use is 40%. This is too low and is not reflective of current sector performance. Had Ofwat set a PR19 PCL using an ex-ante approach that used the 20 spills per overflow figure as the 2023/24 target, this performance range would increase.

153. Ofwat's approach is incorrect as it does not assess variance from an ex-ante target perspective. More recent outturn data from 2023/24 has shown how volatile this metric is to weather (see figure 12) with industry median performance spiking upwards in wet weather years, such as 2023/24. The link to weather effects would make the metric more volatile than Ofwat has assessed, which widens the P10/P90 range and creates a need for lowering of the ODI rate.

154. We have modelled a range of different hypothetical ex-ante targets that could have been set at PR19. We use the figure of 20 spills per overflow as the target for 2023/24 and then set a synthetic target using the average outturn data from 2019/20 with a glidepath set using equal increments between the two. Under this approach, the P10/P90 performance range widens to 85%.

155. The CMA should remedy Ofwat's error by reducing the ODI rate to 0.393[72] based on a wider more reflective P10/P90 range.

[71] Southern Water, Total Pollutions_Storm Overflow_supporting graphs, SOC-6-0030.
[72] Refer to Southern Water, CMA SoC_PCs_ODIs_supporting analysis, worksheet "Storm Overflows", SOC-6-0026.

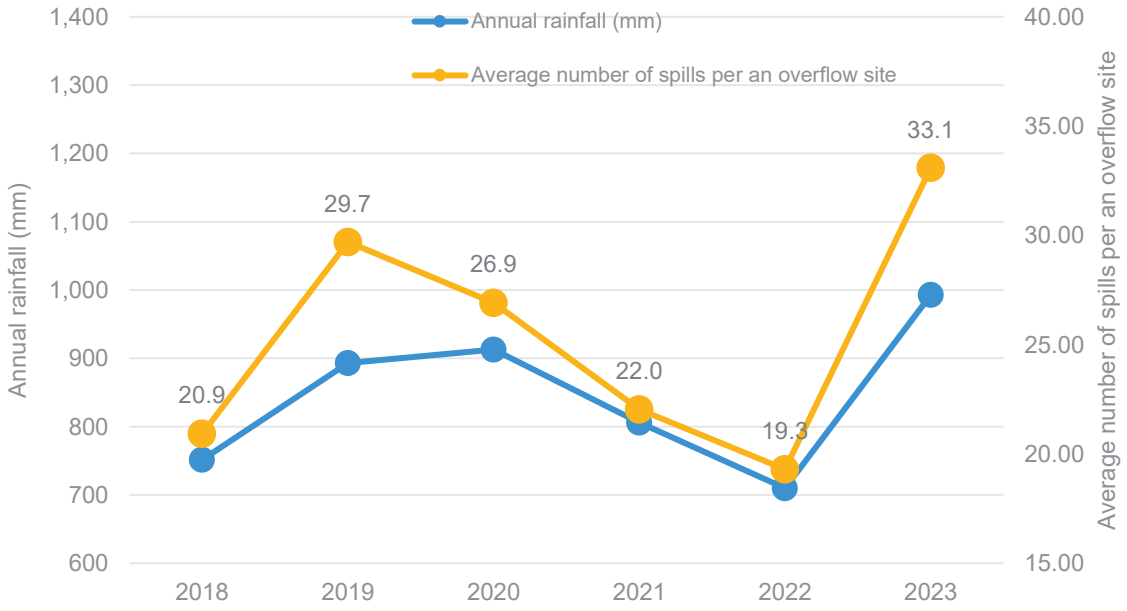
(iv) Cap/collar

In the FD, Ofwat has included a symmetrical cap/collar at +/-0.5% RoRE

156. The PC is influenced by factors out of our control, as it is highly dependent on the weather. Correlation analysis[73] demonstrates a strong positive relationship between rainfall and storm overflow spills. Ofwat does not calculate correlations for storm overflows in its quantitative analysis of sector performance,[74] yet in KPMG's analysis there is evidence of a strong relationship with rainfall. The report also investigates whether the changing climate is likely to worsen the operational performance across key ODIs in AMP8 (including storm overflows). The simulation results imply a material underperformance of storm overflows in both the base-case (P50) and worst-case (P10) scenario.[75] The results also suggest that the FD targets are materially more stretching than expected AMP8 performance for storm overflows.

157. Over the past six years, we have only had one year with less than 20 average spills. Notably, in 2023/24, the score of average spills was greater than 30. Figure 12 below maps average rainfall (mm) in the South of England to the average number of spills per overflow site. In addition, as highlighted in Water UK's report on the National Storm Overflows Plan for England[76], "*individual annual results will depend on how the weather has performed*". This emphasises the impact of weather conditions on the frequency of spills and further supports the need for a nuanced approach when assessing performance.

Figure 12: Annual rainfall and PC score

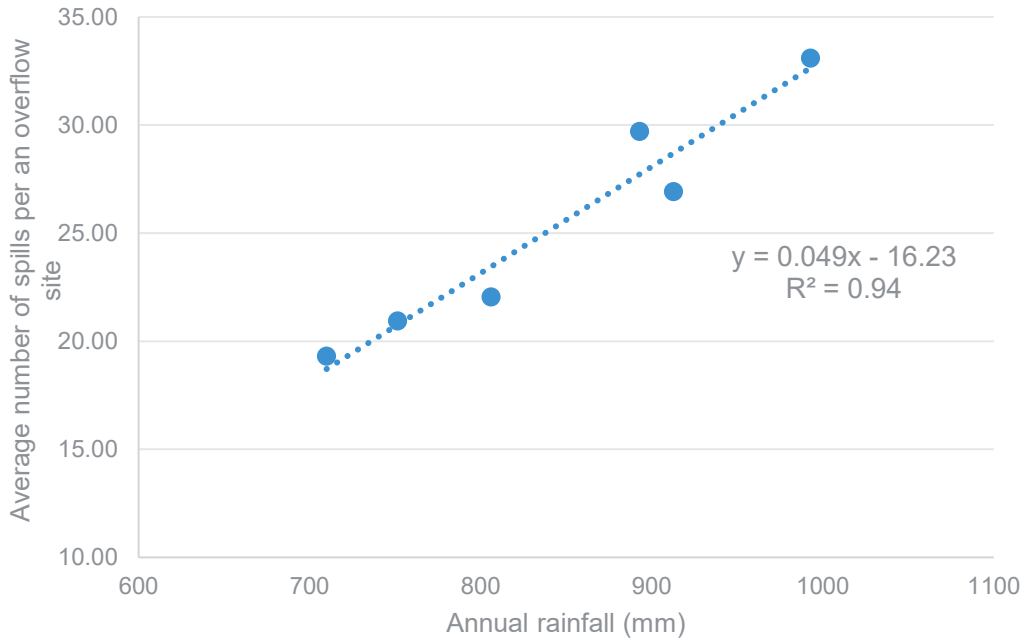


158. Figure 13 below sets out regression analysis to test the strength of the relationship between rainfall and the average number of spills per overflows. There is a positive correlation with the model

[73] Ofwat, December 2024, PR24 final determinations - Outcomes approach to risk modelling appendix, page 7, table 1, SOC-6-0016.
[74] Ofwat, December 2024, PR24 final determinations - Outcomes approach to risk modelling appendix, page 7, table 1, SOC-6-0016.
[75] KPMG, March 2025, Impact of exogenous risk factors on wastewater ODI performance, page 28, SOC-1-0004.
[76] Water UK, March 2024, National Storm Overflows Plan for England, page 16, SOC-6-0014.

giving an R^2 of 0.94 (i.e. shows that over 90% of the variability of the number of overflow spills is explained by rainfall).

Figure 13: Annual rainfall and spill level linear relationship



159. In addition, the performance ranges for some PCs are not achievable to the upside due to natural limits. Given where the PCL for storm overflows is set and the 0.5% RoRE cap, we would be unable to achieve the maximum reward in 2028/29 and 2029/30. A +/- 0.25% RoRE cap would remedy this and represent a more balanced risk profile.

160. Weather is an exogenous risk and beyond management's control and significantly impacts performance (as evidenced above), and the current cap prevents some upside from being achievable in 2028/29 and 2029/30. Tightening the cap/collar to +/-0.25% RoRE will address and mitigate both issues.

(v) Remedy

161. The **remedy** should reduce the ODI rate to 0.393[77] **and set PCL and cap/collar as set out in** Table 9 **below.**

[77] Refer to Southern Water, CMA SoC_PCs_ODIs_supporting analysis, worksheet "Storm Overflows", SOC-6-0026.

Table 9: Remedies for Storm Overflows

	2025/26	2026/27	2027/28	2028/29	2029/30
Ofwat FD Target	17.99	17.95	17.15	15.83	13.71
Remedy PCL	20.45	20.41	19.61	19.61	17.27
Ofwat FD collar (0.5% RoRE)	34.87	34.83	34.03	32.71	30.59
Remedy FD collar (0.25% RoRE)*	38.33	38.29	37.49	37.49	35.15
Ofwat FD cap (0.5% RoRE)	1.11	1.07	0.27	-1.05	-3.17
Remedy FD cap (0.25% RoRE)*	2.57	2.53	1.73	1.73	-0.61

*Cap/Collar calculations based on remedy ODI rate

	Ofwat FD	Remedy
P10 / P90 performance range	40%	85%
ODI	0.833	0.393

Retail measures

4.1.5. Measures of experience: C-MeX, D-MeX and BR-MeX

(i) Measures of experience definition

162. In the FD, Ofwat sets three retail measures of experience:

- C-MeX (Customer measure of experience);
- D-MeX (Developer measure of experience); and
- BR-MeX (Business Customer and Retailer measure of experience).

163. C-MeX is defined as the average customer service score resulting from two sets of customer surveys, the customer service survey and the customer experience survey. The total C-MeX score will be derived from equal weighting from survey results from billing (sample of customers who have been in contact), operational service (sample of customers who have been in contact), and customer experience (random sample of customers).

164. D-MeX is a single score that measures developer services customer experience, based on a satisfaction survey of recent customers and performance against service metrics. The score combines these two components to reflect both customer satisfaction and the company's performance in delivering developer services.

165. BR-MeX is a new PR24 PC that measures wholesaler business customer service, based on three components: the Business Customer Experience Survey (for B-MeX), the Retailer Experience Survey (for R-MeX), and Market Performance Framework (**MPF**) metrics. The score combines customer satisfaction from business customers and retailers, along with performance data from industry benchmarks, to reflect overall wholesaler performance.

166. *The errors identified for **C-MeX** fall under the **RoRE risk and calibration error overarching errors** identified in Section 3.*

167. *The errors for **D-MeX** and **BR-MeX** fall under the **calibration errors overarching error** identified in Section 3.*

(ii) PCL

168. For C-MeX, Ofwat sets a PCL which is dynamically calibrated annually and is based on the UK Customer Service Index (**UKCSI**) benchmark. This means water company performance is compared against that of service providers in the wider economy (i.e. retailers etc).

169. Water companies are likely to have negatively biased scores relative to other organisations in the UKCSI since customers do not have a choice over their water provider. Historical evidence particularly for the last couple of years shows that the median score for water companies has been below the UKCSI all-sector average, even after the 4-5 point downwards adjustment made by Ofwat in the FD[78]. This is likely to lead to a negative balance of risk on C-MeX.

170. Using the UKCSI figures, the average water company performance has deteriorated by 6.62% across the last 5 years vs the 1.78% reduction in the all sectors average. The negative public narrative on the water sector has increased the differential between UK wide sector position and UK water median position. This trend continued in the most recent UKCSI report from January, with future bill increases expected to further decrease customer satisfaction relative to the all-sector UKCSI average. Ofwat have set the differential of using a long run average of 5 and then 4 to create its dynamic target against the C-MeX score. Below is an example of how its new methodology determines the dynamic PCL and the amount of companies in reward for AMP7 performance.

Table 10: UKCSI benchmarks vs companies performance for AMP7

	2020-21	2021-22	2022-23	2023-24	2024-25
Average of all-sectors UKCSI scores	77.40	78.40	76.60	75.80	76.10
Average of water company UKCSI scores	74.30	76.19	72.69	69.50	68.70
Adjustment to UKCSI	-5	-5	-5	-4	-4
UKCSI average benchmark (inclusive of downward adjustments) the dynamic PCL	77.27	74.74	75.45	77.74	78.62
Water company C-Mex Median	80.32	78.70	77.50	74.80	74.10
Companies in reward	13	14	12	5	3

171. The number of companies receiving rewards are reducing year on year. The long-term trend between the sector median and UKCSI all sector average is declining; this does not generate a balanced incentive.

[78] Refer to Southern Water, CMA SoC_PCs_ODIs_supporting analysis, worksheet "C-MEX PCL", SOC-6-0026.

172. In order to set a balanced incentive, Ofwat need to consider the uncontrollable factors of customer experience in the water industry, this is the negative public sentiment in recent years. Thus, below we have done a logarithmic forecast of C-MeX scores for the industry and of the UKCSI water scores and all sector average. A logarithmic forecast reduces the risk of skewed data and outliers, this forecast does widen the water sector average against the UKCSI average.

Table 11: UKCSI benchmarks vs companies' performance for AMP8 forecast

	2025-26	2026-27	2027-28	2028-29	2029-30
Average of all-sectors UKCSI scores	75.87	75.69	75.53	75.39	75.27
Average of water company UKCSI scores	68.95	68.34	67.81	67.34	66.92
Adjustment to UKCSI	-5	-5	-5	-4	-4
UKCSI average benchmark (inclusive of downward adjustments) the dynamic PCL	76.08	76.21	76.35	78.17	78.35
Water company C-Mex Median	73.24	72.53	71.92	71.38	70.89
Companies in reward	6	6	5	3	2

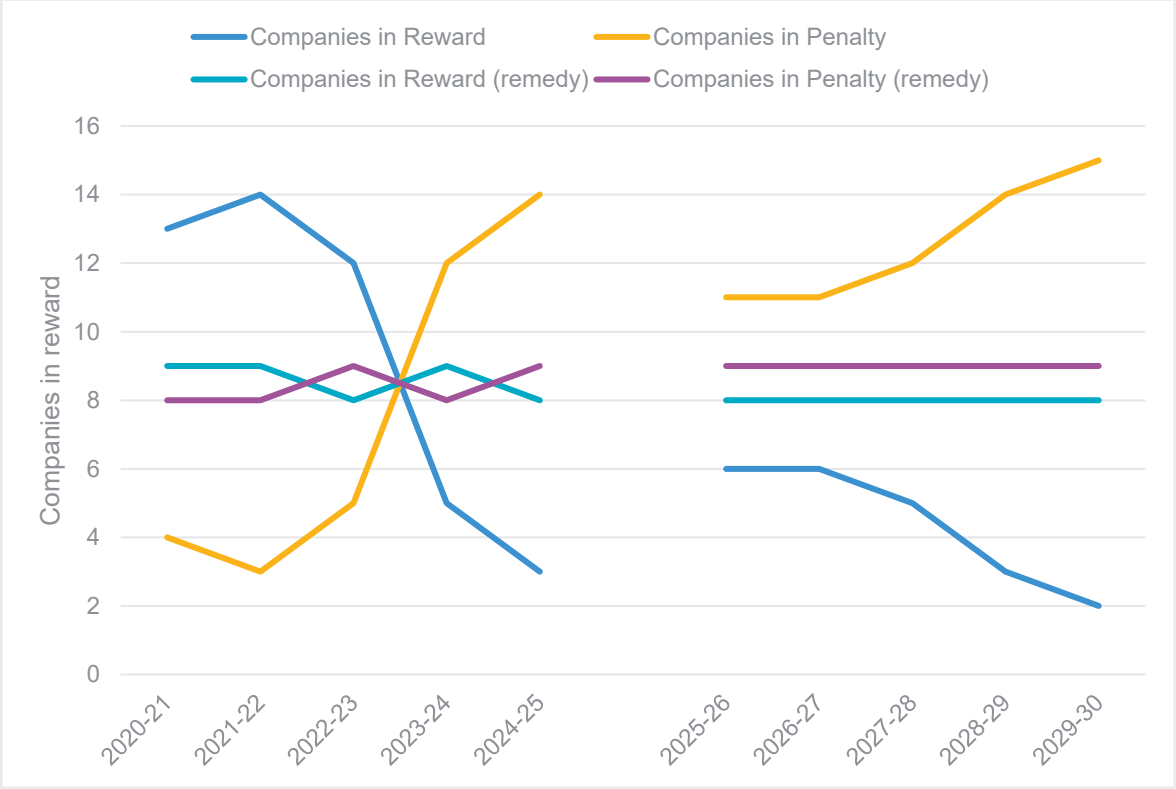
173. As shown by the companies in reward and comparing the C-MeX median performance, the incentive becomes significantly imbalanced for the industry. We have addressed this imbalance, as evidenced by the C-MeX median, which is now much closer to the dynamic PCL. With eight companies receiving rewards, this demonstrates a more balanced performance across the industry.

Table 12: Proposed remedy and outcome

	2025-26	2026-27	2027-28	2028-29	2029-30
Adjustment to UKCSI Remedy	**-6**	**-6**	**-6**	**-7**	**-7**
UKCSI average benchmark (inclusive of downward adjustments) the dynamic PCL	74.52	74.60	74.71	73.15	73.25
Water company C-Mex Median	73.24	72.53	71.92	71.38	70.89
Companies in reward	8	8	8	8	8

174. Figure 14 below shows how the remedy downward adjustment creates a much more balanced incentive for AMP8.

Figure 14: Balance of sector with current adjustment vs proposed adjustment



175. The CMA should remedy this error and set the adjustment as per Table 15

(iii) ODI rate

176. In the FD, Ofwat set ODI rates for the MeX incentives by considering the total amount of our RoRE exposure for each of the ODIs. For C-MeX and D-MeX it considers the historic variations in scores to create a performance range and divides this by the equity at risk to generate an ODI rate of 1.889 and 0.866 respectively. For BR-MeX, the under(out) performance payment is calculated as the difference in company score vs sector median times by 0.20% RoRE divided by maximum score minus median score.

177. The proposed RoRE exposure creates excessive risk for the retail business, as it's determined by Wholesale RoRE. For other PCs, RoRE at risk is determined by the respective price controls.

178. In the FD, Ofwat has finalised its view for setting incentive rates for the measures of experience ODIs. Ofwat has decided to set the incentive rates as a percentage of regulated equity, as follows:
- **C-MeX:** +/- 0.4% of RoRE;
- **D-MeX:** +/- 0.2% of RoRE; and
- **BR-MeX:** +/-0.2% of RoRE.

179. Ofwat proposed this approach in its initial consultation in July 2023. At the time we responded by stating the following:

> "*We agree with the principle of basing maximum payments on a proportion of RoRE but suggest that when setting the % value of RoRE you should consider the proportional size of the retail business compared to the wholesale. If the Regulatory Capital Value grows*

significantly but the retail business stays the same size, the proportion of ODI payment impacting the revenues will rise significantly."[79]

180. Ofwat has not considered the size of the retail revenue, developer services and non-household revenue relative to the wholesale business in the ODI rates it proposed in the FD for the measures of experience. We are concerned about the perverse incentives this could cause given that the regulated equity at risk is a sizable proportion of the revenue of the relevant price controls. The retail business is a thin margin business and if this was a standalone, the level of risk would bankrupt the business in a very short period of time. This does not realistically mimic the economic incentives that would be present in a competitive market given the reduced levers a water retail business has to it (i.e. it has an implicit universal service obligation to all customers whereas competitive retail businesses can design offers to target or discourage certain categories of customer).

181. For example, the proposed ODI rates for the MeXes are excessive compared to the revenue of the relevant price controls:

- **C-MeX (ODI rate of +/- 0.4% RoRE):** our allowed retail revenue for AMP8 is £356m. 0.4% of AMP8 regulated equity is £78m; equivalent to 22% of our retail revenue control in AMP8. This is a sizeable portion of the business at risk;

- **D-MeX (ODI rate of +/-0.2% of RoRE):** our forecast developer services revenue for AMP8 is £117m. 0.2% of AMP8 regulated equity is £39m, equivalent to 33% of our allowed developer service revenue. This is a sizeable portion of the business at risk; and

- **BR-MeX (ODI rate of +/-0.2% RoRE):** our forecast non-household wholesale revenue is £1,268m. 0.2% of AMP8 regulated equity is £39m, equivalent to 3% of our allowed non-household wholesale revenue with no non-household retail revenue due to the competitive market. This is still substantially higher than comparator risk exposures for both water and wastewater PCs.

182. When compared to the collars Ofwat proposes for wholesale PCs, the proportion of ODI at risk against the corresponding revenue for each control is significantly lower than what is being proposed for the MeXes. I.e. As per Ofwat's 'PR24 ODI risk payment calculator' the maximum collar conversion from percentage of 0.4% RoRE to £m is for our wastewater ODIs is £56m over AMP8. This corresponds to 2% of our total wastewater revenue.

183. Another point to consider is the % at risk against retail revenues for AMP6 and AMP7 for the equivalent customer service measures (SIM in AMP6 and C-MeX in AMP7).

184. As shown in Table 13, the value of the C-MeX incentive is double that of previous customer service measures. This represents an excessively high level of risk.

[79] Southern Water, September 2023, Southern Water response to Ofwat consultation on the measures of experience performance commitments at PR24, page 5, SOC-6-0032

Table 13: Historic % of risk for customer service measures

Customer service measure	Retail Revenue (22/23 prices)	Maximum ODI (£m 22/23 prices)	% at risk
SIM (AMP6)	360	43	12%
C-MeX (AMP7)	261	31	12%
C-MeX (FD AMP8)	**356**	**78**	**22%**

(iv) Remedy

185. The **remedy** should be **to reduce ODI rates based on the following RoRE allocations set out at Table 14:**

Table 14: Remedy ODI rates

Retail PC	Method for remedy (RoRE allocation)	Remedy
C-MeX	Lower of 0.4% RoRE or 5% of retail price control revenue	ODI rate of 0.431[80]
D-MeX	Lower of 0.2% RoRE or 5% of developer services revenue	ODI rate of 0.134[81]
BR-MeX	0.1% RoRE in payment calculation	0.1% RoRE in payment calculation

- The PCL should be recalibrated using a downward adjustment of 6 in 2025/26 to 2027/28 and 7 in 2028/29 and 2029/30, as indicated at Table 15 below. This takes into account recent sector deterioration vs the benchmark and creates a more balanced incentive.

Table 15: Remedy PCL adjustment

	2025/26	2026/27	2027/28	2028/29	2029/30
Downward adjustment to UKCSI – Ofwat FD	5	5	5	4	4
Downward adjustment to UKCSI – Remedy	6	6	6	7	7

4.1.6. Downward risk exposure - Leakage, Water Quality Contacts, Bathing Water Quality and Discharge Permit Compliance

(i) Error

186. Ofwat's decision not to include collars on five ODIs, including Discharge Permit Compliance (**DPC**), Water Quality Contacts, and Leakage, is an error. In addition, the collar on Bathing Water Quality is set too wide and doesn't adequately mitigate the risks of that PC. As we have outlined above, there are clear errors in Ofwat's reasoning for not including a collar for serious pollution incidents and the CRI measure. There is no justifiable reason for Ofwat to exclude risk protection on the aforementioned metrics.

[80] Refer to Southern Water, CMA SoC_PCs_ODIs_supporting analysis, worksheet "C-MEX_D_MEX_ODI", SOC-6-0026.
[81] Refer to Southern Water, CMA SoC_PCs_ODIs_supporting analysis, worksheet "C-MEX_D_MEX_ODI", SOC-6-0026.

187. The error here is without these risk mitigation measures there is an open-ended downward risk exposure. As outlined in Chapter 1 (Risk and Financeability),[82] in the FD package, many of the collar levels were set too high or left without one altogether. The upside is naturally limited by the degree of stretch but in most cases downside risk is not well limited except with collars.

188. The decision to not include collars or setting them too wide on the PCs above created an overall package with a high degree of downward risk exposure.

(ii) Leakage and Water Quality Contacts

189. For certain service-related ODIs, such as Leakage and Water Quality Contacts, the lack of a collar creates an imbalance in the regulatory framework.

190. Specifically, the Leakage ODI (defined as "*measuring the percentage reduction in three-year average leakage from the 2019-20 baseline*"), has a 1% RoRE cap being introduced, but no collar. This approach is not consistent in creating a balanced risk and reward package, particularly for leakage, where external factors—such as aging infrastructure, ground movements, and unpredictable weather conditions—can cause unplanned leaks.

191. The absence of a collar for leakage, in contrast to the introduction of the 1% RoRE cap, appears arbitrary and lacks a clear rationale. This absence of risk protection should be challenged, as it fails to provide a fair and balanced regulatory approach for performance metrics that are inherently subject to external and unpredictable influences.

192. Water Quality Contacts is defined as "*the number of times the company is contacted by consumers due to the taste and odour of drinking water or because the drinking water is not clear, reported per 1,000 population*."[83] This performance commitment lacks any form of risk mitigation, which is inconsistent with other service-related measures, such as WSI, which do have a collar.

193. The absence of a collar for Water Quality Contacts creates an imbalance in the regulatory framework. For example, if a large-scale water incident occurs, the current regime would cap the underperformance associated with WSI, but for Water Quality Contacts, the company would be exposed to significant downside risk without any protection. This inconsistency in Ofwat's approach is illogical and does not align with the principles applied to other performance metrics.

194. To address this issue, we propose the introduction of a -0.5% RoRE collar for Water Quality Contacts to provide appropriate risk mitigation, ensuring a fairer and more balanced approach.

(iii) **Discharge Permit Compliance (DPC)**

195. DPC measures the performance of wastewater treatment works and water supply works in line with their numeric discharge permit conditions and is reported as the number of failing sites.

196. For DPC, a similar logic applies as outlined above. External factors, such as potential changes in the EA's definition of compliance—specifically the inclusion of DWF limits—are outside management's control. The EA are actively looking to include DWF limits in their DPC definition as stated below:

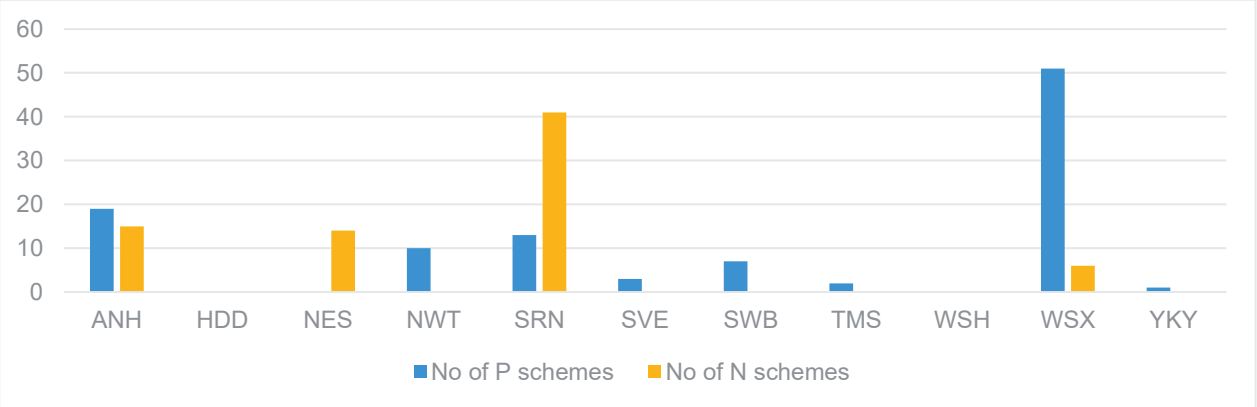
[82] Chapter 1 (Risk and Financeability), paragraph 172.
[83] Ofwat, December 2024, PR24 Common performance commitments - Customer contacts about water quality , SOC-6-0035.

197. "*So for 2026 onwards we should be in a position to include DWF and overflow operation at WwTW compliance within the discharge compliance metric (or separately if appropriate)*."[84]

198. Given that the definitional change is outside the company's control, the CMA should remedy this by introducing a -0.5% RoRE collar for DPC. The current P10/P90 calibration does not account for these potential changes, and the inclusion of a collar would ensure a fairer regulatory approach, allowing for short-term deviations due to unexpected operational challenges.

199. In addition, the following risk factors in AMP8 need to be considered; stricter permits, unique ecological factors, more stringent targets for phosphorus removal than rest of the sector and new sector requirements for nitrogen removal. The Levelling Up and Regeneration Act of 2023 (**LURA 2023**) sets stricter requirements for nutrient neutrality in protected environments. Figure 15 below shows we have the greatest number of nitrogen (**N**)-removal schemes (N schemes) and the second highest number of phosphorus (**P**)-removal schemes (P schemes) after Wessex Water. To demonstrate the magnitude of the AMP8 N schemes: the population equivalent served by the WTWs in our region with tightened N permits will rise by ~6,000% by the end of AMP8 compared to the end of AMP7. This significant increase in permit requirements could impact our performance disproportionately to the rest of the sector and Ofwat have not taken these factors into account when considering the downside risk of this PC.

Figure 15: Number of P schemes and N schemes required under LURA 2023



200. The introduction of an underperformance collar would remedy the above and protect us from undue penalties while holding the company accountable for its performance, creating a more balanced and realistic framework.

(iv) **Bathing Water Quality**

201. Bathing Water Quality is a new PC introduced at PR24. It is a single overall average 'score' measuring the quality of our waters designated for swimming, ranging from 0 (all bathing waters are of poor quality) to 100 (all bathing waters are of excellent quality).

202. In the FD, Ofwat set symmetric caps/collars applied at the +/-0.5% level. There are fundamental flaws in the way Ofwat have calibrated risk for this PC:

[84] Environment Agency, February 2024, Water and sewerage company Environmental Performance Assessment (EPA) methodology (version 11) for 2021 to 2025, SOC-6-0028.

- The RoRE value at risk is not equal between WASCs. 74% of bathing water sites are covered by 4 companies (South West, Welsh Water, Southern Water and Anglian) yet these only represent 28% of wastewater customers. As a result, the value at risk for coastal companies (e.g. Southern Water) is more material than for inland companies (e.g. Severn Trent);

- Sector wide asymmetry means this shouldn't be thought of as a common performance commitment, its more bespoke in nature to those companies with the most exposure;

- Misconnections, caused by developers' lack of incentive to properly connect new builds and retrofits, have a negative impact on bathing water quality, with Southern Water having to proactively inspect and fix these issues, highlighting the importance of the misconnections programme. One example was at Folkestone, where an investigation into Bathing Water led to misconnections being found and rectified; and

- There is no botex adjustment for coastal effects (as outlined in our 2023 CAC challenge[85]) yet coastal companies face additional downside risk. This metric creates an asymmetric downside risk between companies that is not reflected in the notional return.

203. To remedy these factors, we request that the CMA tightens the cap/collar for Bathing Water Quality. We recommend reducing the collar to +/-0.25% RoRE which is consistent with our DD Response.

(v) Remedy for open ended downward risk exposure is to create a more balanced package with the inclusion /tightening of collars for these PCs

204. These individual measures collectively help support a more balanced package overall and reduce our downside risk exposure.[86]

205. The remedy should be to introduce:

- A -0.5% RoRE collar for Leakage;

- -0.5% RoRE collar for Water Quality Contacts;

- -0.5% RoRE collar for Discharge Permit Compliance; and

- Tightening the cap/collar to +/-0.25% RoRE for Bathing Water Quality.

Table 16: Collar for Leakage

	2025/26	2026/27	2027/28	2028/29	2029/30
Ofwat FD performance	102.20	93.80	86.90	80.00	73.10
Remedy collar (-0.50% RoRE)	110.16	101.76	94.86	87.96	81.06

*Figures represent the Leakage, three year rolling average leakage level

[85] Southern Water, August 2024, SRB-DDR-015: Coastal Population - Cost adjustment claim, SOC-6-0036.
[86] See Chapter 1 (Risk and Financeability).

Table 17: Collar for Water Quality Contacts

	2025/26	2026/27	2027/28	2028/29	2029/30
Ofwat FD PCL	1.09	1.02	0.95	0.88	0.81
Remedy collar (-0.50% RoRE)	3.99	3.92	3.85	3.78	3.71

Table 18: Collar for Discharge Permit Compliance

	2025/26	2026/27	2027/28	2028/29	2029/30
Ofwat FD PCL	100.00	100.00	100.00	100.00	100.00
Ofwat FD Deadband	99.00	99.00	99.00	99.00	99.00
Remedy collar (-0.50% RoRE)	86.55	86.55	86.55	86.55	86.55

Table 19: Bathing Water quality cap/collar remedy

	2025/26	2026/27	2027/28	2028/29	2029/30
Ofwat FD performance	75.70	80.20	84.50	86.00	86.00
Ofwat FD collar (-0.5% RoRE)	71.28	75.78	80.08	81.58	81.58
Ofwat FD cap (+0.5% RoRE)	80.12	84.62	88.92	90.42	90.42
Remedy collar (-0.25% RoRE)	73.49	77.99	82.29	83.79	83.79
Remedy cap (+0.25% RoRE)	77.91	82.41	86.71	88.21	88.21

Chapter 7

Weighted Average Cost of Capital (WACC)

1 Executive summary

1. The cost of capital (weighted average cost of capital or 'WACC') is the return that we are allowed (expressed as a percentage of our regulatory capital value or 'RCV'). It comprises both an allowed return on equity and debt. The cost of capital is critical at AMP8 to attract the investment we need to deliver a resilient water service for our customers.

2. PR24 is fundamentally different to PR19. We must compete for unprecedented levels of new capital at a time where investor sentiment towards our sector is at an all-time low and competition for capital across infrastructure sectors has strongly intensified. We face a step-change in risk and interest rates are expected to stay 'higher for longer'. These factors underscore the need for a financeable allowed return and mean the financeable allowed return for AMP8 must be above that in previous AMPs.

3. Our capital programme is larger and more complex than that of other companies due to the specific characteristics of our local region. This means that our plan for AMP8 is risker than for other companies which underscores our need for a financeable allowed return. Further, we are a company in turnaround and an unfinanceable allowed return will weaken our ability to achieve a successful turnaround at the pace we want and our customers expect.

4. Ofwat has a statutory duty (s.2(2A)(c) of the Water Industry Act 1991) to secure that companies are able (in particular, by securing reasonable returns on their capital) to finance the proper carrying out of their functions. The CMA must make its determination in accordance with Ofwat's finance and other duties. Setting a financeable allowed return is essential to ensuring compliance with this duty.

Error 1: The allowed return on equity fails market tests

5. Market tests show that Ofwat's allowed return on equity does not:

- **Risk-reflective vs other asset classes:** Provide an appropriate equity risk premium for water equity over water debt. The difference between the allowed return and the cost of new debt for water companies is at an all-time low. This means there is a low incentive for investors to invest in higher-risk water equity over water debt;

- **Risk-reflective vs other sectors:** Provide an equity return that is comparable to other sectors of comparable risk. The allowed return is below that Ofgem has set for energy in the RIIO-3 Sector Specific Methodology Decision, and infrastructure fund equity internal rates of return. This means there is a low incentive for investor to commit capital to water as there are higher returns available in other sectors for lower (energy) or comparable (wider infrastructure) sectors;

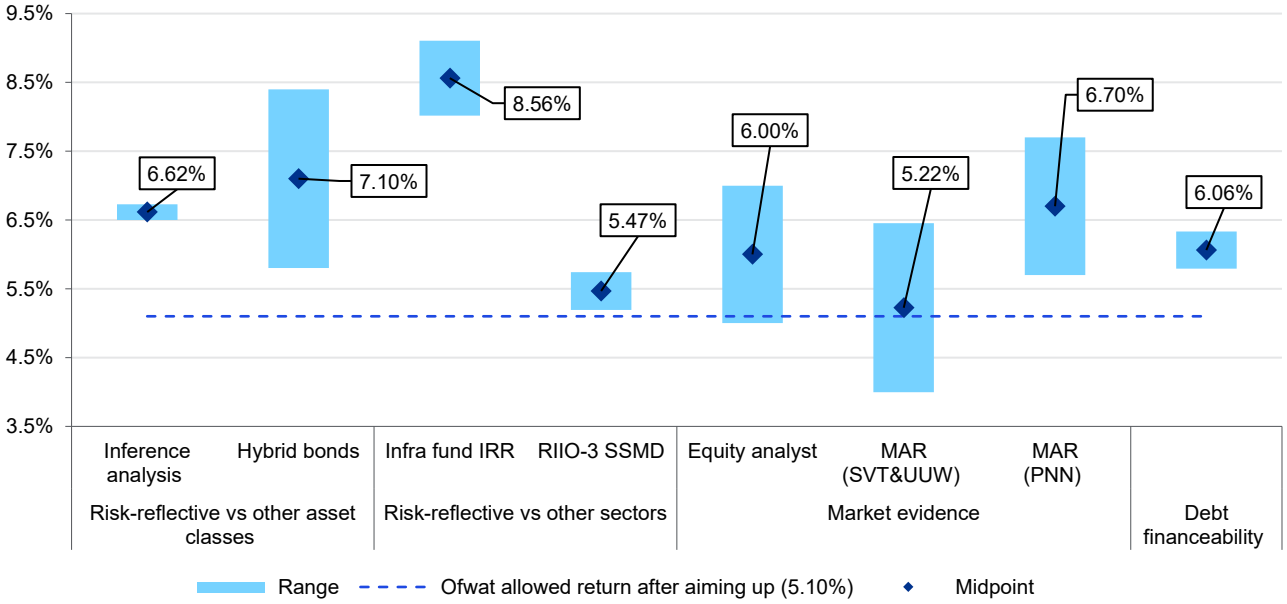
- **Market evidence:** Provide an equity return that is consistent with market evidence, including Ofwat's own cross-check. Ofwat's market-to-asset ratio (MAR) analysis clearly shows that its allowed return is: (1) below the midpoint of the MAR-implied cost of equity across the listed water companies (SVT, UUW and PNN); and (2) is below the entire range of the MAR-implied cost of equity for PNN which is more representative of the notional company than SVT/UUW; and

- **Debt financeability:** Secure debt financeability for a notional company with our specific characteristics. Our financeability assessment shows that a notional company with our specific characteristics cannot achieve the notional rating of Baa1/BBB+. The CMA in its PR19

Redetermination relied heavily on debt financeability to assess the sufficiency of its allowed return on equity.

6. The comparison between the allowed return and these market tests is shown in the chart below.

Figure 1: Ofwat allowed return after aiming up vs market tests (CPIH-real, 55% gearing, excl. RMA)



Source: Southern Water analysis based on KPMG and Frontier Economics reports.

7. Ofwat's allowed return on equity fails these tests because it has: (1) not reflected the changes in risk for the sector since PR19; and (2) made a series of technical errors in its estimation of the cost of equity parameters. These errors are covered in the error below.

Error 2: The allowed return on equity is based on erroneous parameter estimates

8. The errors across Ofwat's estimates of the cost of equity parameters are as follows:

- **Risk free rate:** The risk-free rate does not reflect that: (1) investors' risk-free borrowing rate is higher than their risk-free saving rate; and (2) index-linked gilts benefit from the convenience yield which depresses their yield below the risk-free saving rate;
- **Total market return:** The total market return: (1) places weight on historical ex-ante estimates instead of placing sole weight on more reliable historical ex-post estimates; and (2) is based on historical ex-post estimates which assume serial correlation is present and only the investor perspective is relevant;
- **Beta:** The beta: (1) does not place weight on PNN's beta which is more representative of the notional company and is higher than SVT/UUW; (2) places excessive weight on periods in which large sections of the economy were shut and thus assumes such periods reoccur in AMP8; and (3) does not reflect the expected increase in risk for AMP8, particularly under our plan, and instead implies risk has reduced relative to AMP7;

- **Aiming up excluding for asymmetry:** The aiming up: (1) does not meet Ofwat's intention of ensuring that the allowed return can attract investment rather it serves to partially offset the downward bias in selection of estimates for the parameters above; (2) implies a cost of equity that is below its one and only cross-check, the MAR; and (3) based on a wider suite of cross-check evidence (such as alternative asset pricing models to the Capital Asset Pricing Model and debt financeability) supports a higher adjustment;

- **Aiming up for asymmetry:** The aiming up does not factor in downside asymmetric risk in equity returns for a notional company with our specific characteristics. This means that investors do not face a fair bet. Investors will not commit new equity capital where they do not face a fair bet; and

- **Retail margin adjustment:** The retail margin adjustment: (1) does not reflect that the retail business is integrated with the wholesale business and therefore should be financed with equity to avoid appointee gearing increasing above the notional level. At a minimum, the retail business should be financed at the appointee WACC; and (2) accounts for the revenue on DPC and SIPR assets but not the cost of financing these fixed assets.

Error 3: The allowed return on debt does not reflect the sector average company's actual debt costs

9. Ofwat's policy on debt is that the sector average company is the proxy for the notional company. Ofwat's allowed return on debt does not allow the sector average company to recover its efficient debt costs.

10. This is a result of the following technical errors:

- **Cost of embedded debt:** The cost of embedded debt: (1) places weight on the 'actual-notional' cost rather than sole weight on the 'all-in' cost. As sole weight is not placed on the 'all-in' cost, the allowance underfunds the sector average company's actual cost of embedded debt; and (2) is based on an 'all-in' cost that excludes swaps even though swaps are actively used by the sector for efficient purposes;

- **Cost of new debt:** The cost of new debt: (1) is based on secondary market analysis of Baa1/BBB+ water bonds but this analysis does not control for tenor; and (2) assumes that the notional company can achieve a Baa1/BBB+ rating but in practice the notional company is likely to be closer to Baa2/BBB; and

- **Share of new debt:** The share of new debt is based on a calculation that contains errors, outdated data and internal inconsistencies. This results in a share of new debt below that for the sector average company.

Error 4: The allowed return on debt fails to take account of factors outside of company control

11. Ofwat's allowed return on debt does not reflect factors outside of company control across the cost of debt parameters below:

- **Cost of embedded debt:** The cost of embedded debt assumes that the gap between an individual company's actual cost and the allowance is solely due to management inefficiency.

In practice, an individual company's actual cost is driven by a range of factors that are not completely within management control. As such, it is wrong to allocate 100% of the risk between allowance and actual costs to companies;

- **Share of new debt:** We have a capital programme that is the largest in the sector in terms of RCV growth. This is outside of our control and as such, our share of new debt should reflect our company-specific RCV growth. Instead, our share of new debt is based on the RCV growth of the sector average company;

  As the cost of new debt is higher than the cost of embedded debt, an understated share of new debt will underfund our new debt. This disincentives us from investing as not investing limits our requirement for new debt and thus our level of underfunding;

- **Basis risk:** Ofwat has implemented a full transition to the CPIH inflation index which introduces additional financing risk and cost for companies. Ofwat has not provided an allowance to manage these additional risk/costs even though its decision was outside of company control. Relatedly, this contravenes Ofwat's own commitment to implement the transition to CPIH in a neutral manner;

- **Cost of carry:** The cost of carry: (1) does not reflect prefinancing for maturing debt; (2) assumes that the RCF is available only to support prefinancing and not unforeseen circumstances; and (3) does not reflect forward-looking expectations of interest rates; and

- **Liquidity cost:** The liquidity cost is based on inputs from the DD rather than the FD.

Error 5: The reduction to notional gearing is not supported by evidence

12. Ofwat's has reduced notional gearing from 60% to 55%. This is in error because:

- Ofwat has increased business risk for the notional company but sought to offset the impact of this on the notional company's financial resilience by reducing its gearing. This does not reduce risk at the enterprise level. It merely transfers risk from debt to equity and could instead worsen risk at the enterprise level as ODI exposure increases mechanistically in proportion to the quantum of regulated equity;

- Ofwat places weight on actual debt costs to estimate the allowed return on debt. To maintain consistency across the allowed WACC, Ofwat should place weight on actual gearing levels to estimate notional gearing. All companies are geared above 55% and the sector average is 68.9%; and

- The rating agency methodologies for Fitch and Moody's place weight and consider independently metrics for gearing and coverage. 60% gearing typically implies a Moody's and Fitch rating of A3/A-. This suggests that gearing is not a constraint for the notional company.

Impacts

13. In sum, the allowed return on equity fails market tests and the allowed return on debt does not provide for efficient debt costs.

14. The consequence is that there is a low incentive for investors to allocate new capital to the water sector. This means that the allowed return is not financeable and therefore Ofwat has not met its finance duty.

15. An unfinanceable allowed return:

- Creates harmful outcomes for customers as recognised by the CMA in its PR19 Redetermination. In the short-term, it could jeopardise the sector's ability to secure the investment needed to upgrade its asset resilience and service levels. In the long-term, it will drive a higher required WACC. It is particularly harmful for our customers due to the scale of the capital programme required in our plan, in addition to which it may undo the progress and momentum on our turnaround; and

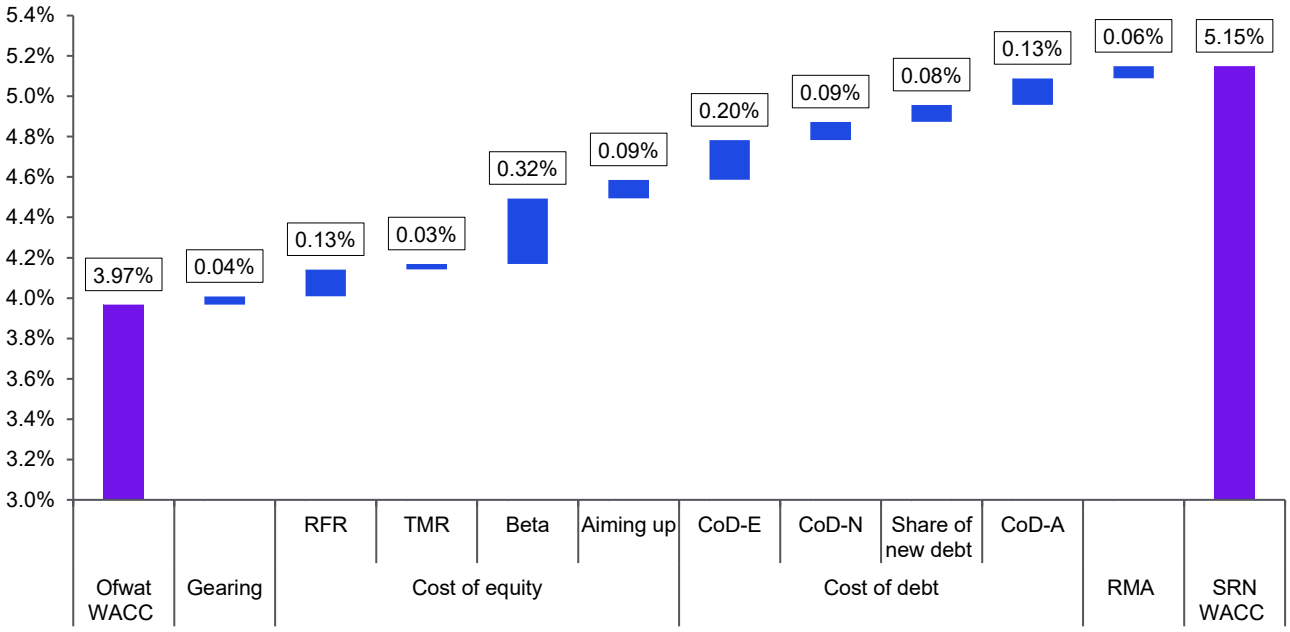
- Is not in the UK national interest or in the interest of our environment. It impedes implementation of the government's policies for improving the environment and its agenda to promote economic growth. In respect of the latter, the government recently placed a growth duty on Ofwat. An unfinanceable allowed return creates a regulatory barrier to investment and therefore Ofwat has also not met its growth duty.

Remedies

16. We request the CMA to replace Ofwat's unfinanceable allowed return with our estimate of the WACC. Our estimate of the WACC protects our customers against these harmful outcomes.

17. Ofwat's allowed return is 3.97% and our estimate of the WACC is 5.15%. Our estimate does not include aiming up for asymmetry. Ofwat's allowed return and our estimate of the WACC is bridged in the chart below.

Figure 2: Ofwat's allowed return vs Southern Water's estimate of the WACC (CPIH-real)



Notes: CoD-A refers to the sum of basis risk, cost of carry, liquidity cost and issuance cost.

Source: Southern Water analysis.

18. The gap between Ofwat's allowed return and our estimate of the WACC is c.£596m (nominal) in total over AMP8.

19. In addition, our risk analysis shows that a notional company with our specific characteristics is subject to downside asymmetric risk of 0.52%. This should be compensated through an asymmetric risk premium of 0.52% on top of our estimate of the cost of equity (or 0.21% on top of our estimate of the WACC). This amounts to an additional c.£100m (nominal) in total over AMP8.

2 Introduction

2.1 Role and importance of the allowed return at PR24

20. The cost of capital (WACC) is the cost that a company is required to pay its investors for making capital available to the company i.e. it is the investors' required return. Ofwat provides companies with an allowed return which reflects its estimate of the required return for investors in the water sector.

21. The allowed return plays two important roles in the regulatory framework. First, investors will only allocate capital to companies if the allowed return appropriately compensates them for the risks involved over the long-term. Second, the allowed return should provide the company with sufficient financial buffer to achieve the target rating of Baa1 and withstand plausible adverse shocks without losing a strong investment grade rating.

22. The two roles of the allowed return are highly complementary to each other. The first role of the allowed return in attracting capital from investors is the focus of this chapter.

23. Ensuring the allowed return is appropriate is not solely an investor concern, it is strongly in the long-term interest of customers and the government. It is in the customer interest because the water sector relies on investors to continuously finance new capital projects that secure the resilience of water infrastructure and improve service levels. This has long been recognised by regulators. It is in the government interest as: (1) investors are financing new capital projects that have been designed to meet environmental policy; and (2) enabling investment is in line with the government's agenda to promote economic growth.

24. In previous price controls, Ofwat has prioritised short-term customer benefits in the form of lower bills through a combination of inappropriately low allowed capex and return. It is clear that these short-term benefits have been outweighed by the long-term consequences to customers through reduced investment in the water sector. This has reached a climax at AMP8; the resilience of water infrastructure is now weakened and service levels have not improved as expected due to successive price controls of low investment.

25. In consequence, the water sector urgently needs an influx of investment to secure the resilience of water infrastructure and substantially improve service levels at AMP8. It also needs investment to comply with new environmental laws and adapt to climate change. This means that the allowed return must be set appropriately to prioritise investment for the long-term benefit of customers.

26. Relatedly, Ofwat's regulatory approach of prioritising bills over investment has eroded investor confidence in the water sector to an all-time low. This is at a time where the need for investment in the water sector is at an all-time high. The CMA has to restore investor confidence in the water sector by setting an allowed return that is sufficient to attract the influx of investment required at AMP8.

27. The CMA's PR19 Redetermination helped with restoring investor confidence in the water sector but Ofwat departed almost immediately from the principles in the CMA's PR19 Redetermination at PR24. In particular, Ofwat reversed almost all of the CMA's changes for setting the allowed return. We request that the CMA at PR24 sends a clear signal that Ofwat's regulatory approach should incentivise sustainable investment in the sector. Such an approach requires substantive changes to Ofwat's methodology for setting the allowed return.

28. Absent these changes, Ofwat's allowed return would lead to outcomes that are harmful to customers and investors. In the short-term, it could jeopardise the water sector's ability to attract the investment required to deliver the capital programme for AMP8. Deferral of the capital programme could undermine levels of infrastructure resilience and service in the water sector. In the long-term, it will increase the required return for investors as the risk that the allowed return does not equal the required return will have crystallised.

2.2 PR24 is fundamentally different to previous price reviews which has important implications for the allowed return

2.2.1 PR24 is fundamentally different to previous price reviews

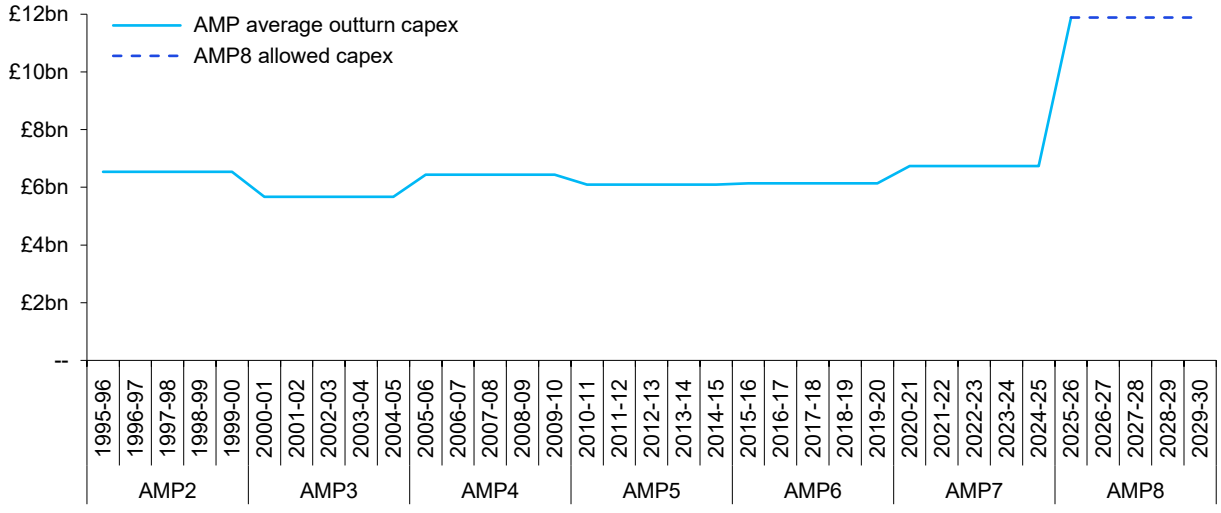
29. PR24 is fundamentally different to previous price reviews because:
- Water companies have to compete for unprecedented levels of new capital;
- Global competition for infrastructure capital has strongly intensified;
- Water companies have shifted from a dividend stock towards a growth stock;
- Investor perception of risk in the water sector has sharply increased;
- Water companies face a step-change in risk exposure on a forward-looking basis; and
- Interest rates are expected to stay 'higher for longer'.

30. These factors have been emphasised to Ofwat throughout the PR24 process but Ofwat has not accounted for these appropriately. The factors are each covered in turn below for simplicity (although there are interactions between them).

Water companies have to compete for unprecedented levels of new capital

31. The scale of the capital programme mandated for AMP8 is an order of magnitude above that for previous AMPs as shown in the chart below. To finance this capital programme, companies will have to compete for unprecedented levels of new debt and equity capital.

Figure 3: Capex across the sector over AMP2-AMP8 (2022-23 CPIH)



Source: Southern Water analysis based on Ofwat PR24 FD financial models and data series of company costs[1]

[1] See Southern Water, March 2025, WACC Data book, worksheet "C_Figure 3", SOC-7-0001.

32. The need to compete for significant levels of new equity capital is a major change from previous AMPs because there is a considerably higher hurdle to secure new equity than new debt. In previous AMPs companies were able to largely finance their capital programme with debt and retained earnings[2]. In effect, companies only had to service the embedded equity put in place at privatisation.

33. Companies have never had to compete for this level of new capital, in particular, equity capital under Ofwat's framework. AMP8 will be the first time that Ofwat's framework is tested in this way.

Global competition for infrastructure capital has strongly intensified

34. Investors generally view all infrastructure sectors worldwide as sufficiently similar in terms of risk to be treated as a single category. As such, they allocate a single pool of capital to cover all infrastructure. This pool of capital is typically referred to as infrastructure capital.

35. Infrastructure sectors within and outside the UK, like UK Water, have materially increasing capital requirements which has intensified the competition for infrastructure capital. This competition has shifted the demand curve for infrastructure capital to the right as shown in the chart below. This means that for the same quantity of capital, infrastructure companies are now willing to pay a higher price of capital.

36. Within the UK, the competition for infrastructure capital has come from regulated energy but also other parts of the energy value chain such as offshore wind. Outside the UK, it has come from infrastructure sectors in the US and Europe.

37. The supply curve for infrastructure capital is flat in finance theory. However, in the real world, it is upward sloping due to market imperfections which are assumed not to exist in finance theory. These market imperfections include *inter alia* that the supply of capital is segmented.

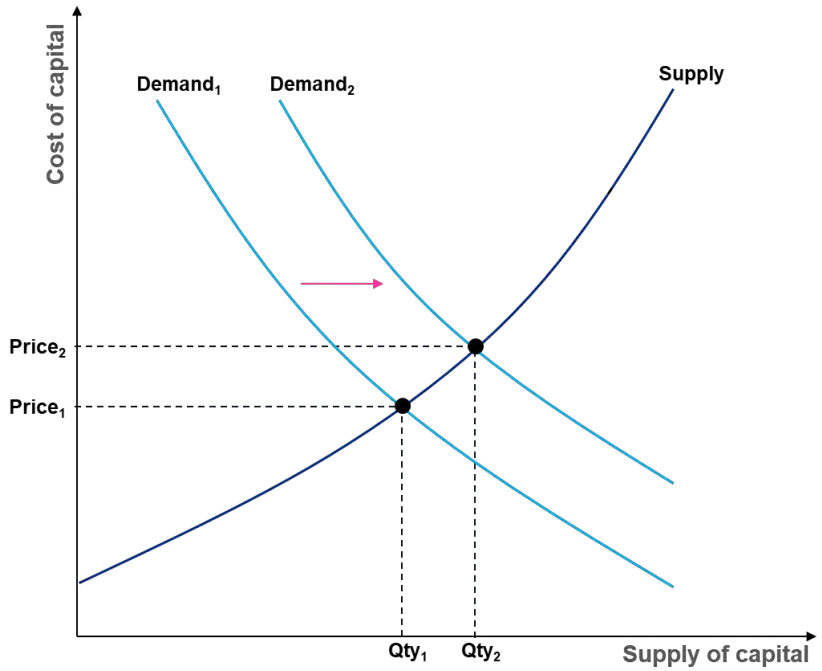
38. The supply of capital is segmented across different groups of investors with finite quantities of capital, finite limits on allocations to sectors and companies, and different risk-return preferences. As infrastructure companies move up the supply curve, they need to access groups of investors that align *decreasingly* well with the infrastructure risk-return profile.

39. Accordingly, infrastructure companies need to pay an *increasingly* higher price of capital to entice investors as they move up the supply curve. This means the marginal price of capital on the supply curve is increasing i.e. upward sloping.

40. As the supply curve is upward sloping, the shift in the demand curve to the right will result in a new higher market-clearing quantity and price for infrastructure capital. This is shown in the chart below.

[2] Oxera, August 2024, Investability at PR24: Final report for Water UK, page 21, SOC-7-0002.

Figure 4: Evolution of supply and demand for infrastructure capital



Source: Southern Water analysis.

41. This means in order to successfully compete for new capital, it is critical that water companies are able to make an attractive investment case to the market. Specifically, the investment case has to reflect the new higher market-clearing price for infrastructure capital.

42. National Grid's regulated US businesses earn nominal allowed returns on equity of 8.8-11.1%[3]. Oxera recently conducted a survey with major infrastructure investors and found that these investors require a nominal return on equity in the water sector ranging from 8-10%+[4]. These observations could provide an indication of the new higher market-clearing cost of equity.

Water companies have shifted from a dividend stock towards a growth stock

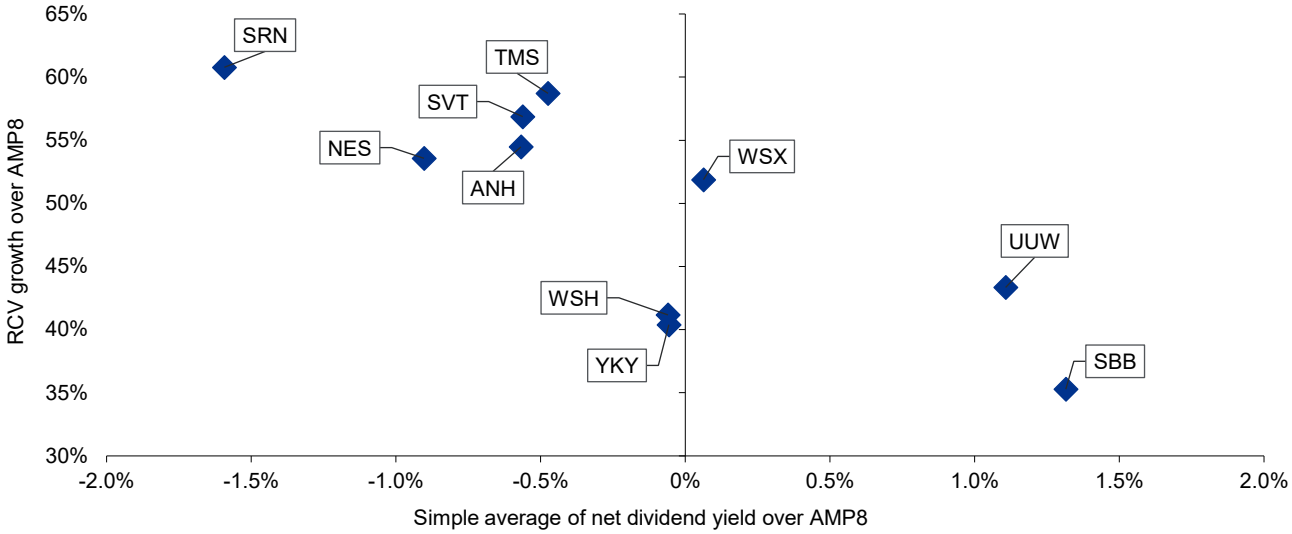
43. Regulated utilities is a unique asset class that appeals to a very specific type of equity investor with well-established investment criteria. These equity investors strongly prefer dividends over growth and have accepted below market returns in exchange for the cashflow certainty provided by dividends. In essence, these equity investors are seeking low risk, low dividend yielding stocks.

44. However, the capital programme for AMP8 has fundamentally changed the investment case for the water sector. In particular, water companies have shifted from a consistent and predictable dividend yielding stock towards a growth stock. In the eyes of investors, water companies may be less comparable to other regulated utilities and more to high growth parts of the energy value chain.

45. The chart below shows RCV growth vs net dividend yield[5] for WaSCs over AMP8 based on the notional structure. The chart confirms that water companies are growing considerably but cannot pay net dividends.

[3] National Grid, May 2024, US Databook - New York and New England regulated businesses, page 7, SOC-7-0003.
[4] Oxera, October 2024, PR24 Investor Engagement Report: Final report for Water UK, page 20, SOC-7-0004.
[5] Net dividend yield = (dividends less equity injections) / (average regulated equity plus equity injections).

Figure 5: RCV growth vs net dividend yield for WaSCs over AMP8 (nominal)



Notes: (1) SVE and HDD are combined as SVT; (2) TMS excludes the impact of Tideway; (3) TMS and Southern Water are based on financial models including additional delivery mechanism.
Source: Southern Water analysis based on Ofwat PR24 FD financial models[6].

46. Existing equity investors, particularly pension funds that rely on dividends to fund retiree obligations, are heavily impacted as the consistency of dividends decreases. In consequence, existing equity investors in the sector may sell their water stakes to new equity investors that favour growth over dividend consistency.

47. These new equity investors are likely to demand a higher return to compensate for the cashflow uncertainty associated with growth. They may need to wait a long time for water companies to revert to a consistent and predictable dividend yielding stock.

Investor perception of risk in the water sector has sharply increased

48. Ofwat has acknowledged that *"investor sentiment towards the water sector is currently low"*[7]. Investor perception of risk in the water sector has sharply increased because:

Inability to meet Ofwat's benchmarks

49. Investor confidence in the sector has reduced due to the sector's inability to meet Ofwat's benchmarks[8]. In AMP7, all 17 companies have needed to invest more totex than allowed by Ofwat. All but two companies (SVT and UUW) have been unable to meet Ofwat's stretching performance targets and hence have received ODI penalties.

50. Importantly, SVT and UUW are the only companies on which Ofwat has based its beta for AMP8. As they are the lowest risk companies in the sector, it means Ofwat's beta is not reflective of the average company.

[6] Southern Water, March 2025, WACC Data book, worksheet "C_Figure 5", SOC-7-0001.
[7] Ofwat, December 2024, PR24 final determinations - Aligning risk and return – allowed return appendix, page 84, SOC-7-0005.
[8] Oxera, August 2024, Investability at PR24: Final report for Water UK, pages 24-25, SOC-7-0002.

51. SVT recently announced that it is confident it can deliver a third consecutive AMP of sector-leading operational performance over AMP8. Its plan shows operational RoRE outperformance of 70bps over AMP8. JP Morgan considers SVT's guide is conservative and expects SVT to deliver 100bps of operational RoRE outperformance[9].

Ofwat's framework is less supportive of investment than other sectors and jurisdictions

52. In the last year, Moody's downgraded Ofwat's framework to an A rating[10] and S&P downgraded it to a strong/adequate rating[11]. In contrast, Moody's rates Ofgem's framework at Aaa (i.e. two notches higher) and S&P rates it as strong. As such, the cost of debt and equity capital for water companies at PR24 is higher than for energy companies as well as higher than at PR19.

53. Moody's rating also places Ofwat's UK Water regulatory framework two notches lower than leading European regulators such as those in Ireland and in line with less-established regimes in Estonia and Portugal[12]. S&P previously viewed Ofwat's framework as comparable to well-established energy regulators in markets like France, Italy, Sweden and the Czech Republic. It now rates Ofwat alongside regulators in Spain, Slovakia, Hungary and the Baltic states[13]. This is a material change since PR19.

54. GIIA[14], a membership body for global infrastructure investors, and Barclays[15] recently conducted equity investor surveys. Barclays' survey found that UK Water has the riskiest regulatory framework in Europe. GIIA's survey found that European Water has the worst outlook across infrastructure sectors worldwide and this is almost entirely driven by UK Water. It also found that an unattractive regulatory framework is the standout barrier to investment in the UK. These findings match the sentiment of the rating agencies.

55. The US and Europe are generally seen as more supportive destinations for infrastructure investment than the UK. For example, the US passed legislation to commit >$1.5tn of government funding to infrastructure. This makes infrastructure investments less risky for private investors according to Goldman Sachs[16]. Europe is seen as having lower political and regulatory risk than the UK[17].

Reputational risk of the sector

56. There is increasing public and regulatory scrutiny over the sector's environmental track record. For example, the sector has attracted negative media attention and Ofwat/EA have conducted investigations into companies' historical wastewater activities. This has heightened the reputational risk of investing in the sector. Some companies have already received large fines as a result of Ofwat/EA investigations. This has given rise to new financial risk outside of the core regulatory framework for investors.

Uncertainty created by TMS financial situation

57. TMS is at present experiencing considerable financial issues[18]. Several of its equity investors have written off their stakes and its bonds were recently downgraded to junk status by Moody's and S&P. This was amidst speculation that senior debt providers would need to suffer haircuts to facilitate new equity coming into the business.

[9] J.P. Morgan, March 2025, SVT, NTGY, EU/FRENCH GAS,NTGY/AENA, PNN, SOC-7-0006.
[10] Moody's, November 2024, Reduced predictability of regulatory environment pressures credit quality, page 2, SOC-1-0012.
[11] S&P, February 2025, U.K. Water Regulatory Framework Support, Low Financial Flexibility In Coming Regulatory Period Drive Rating Actions, SOC-1-0013.
[12] Moody's, August 2024, Ofwat's draft determination increases sector risk, Exhibit 14, SOC-7-0009.
[13] S&P, September 2024, Utilities Handbook 2024, pages 8 and 16, SOC-7-0010.
[14] GIIA, 2024, INFRASTRUCTURE PULSE Q4 2024 Survey , pages 2 and 7-8, SOC-7-0011.
[15] Barclays, November 2024, UK Water - Rating agencies and investor survey: all about contagion, page 17, SOC-7-0012.
[16] Goldman Sachs, December 2023, Infrastructure: an Evolving Asset Class, page 3, SOC-7-0013.
[17] Oxera, August 2024, Investability at PR24: Final report for Water UK, page 29, SOC-7-0002.
[18] Oxera, August 2024, Investability at PR24: Final report for Water UK, page 27, SOC-7-0002.

58. In this context, there is increasing speculation that Ofwat may trigger its special administration regime for the first time at TMS. This has created significant uncertainty within the sector and investors, in particular, are concerned about contagion risk. Investors have already priced in this contagion risk as is reflected in the highly elevated spreads observed on recent water bond issuances.

Unstable equity returns and dividends

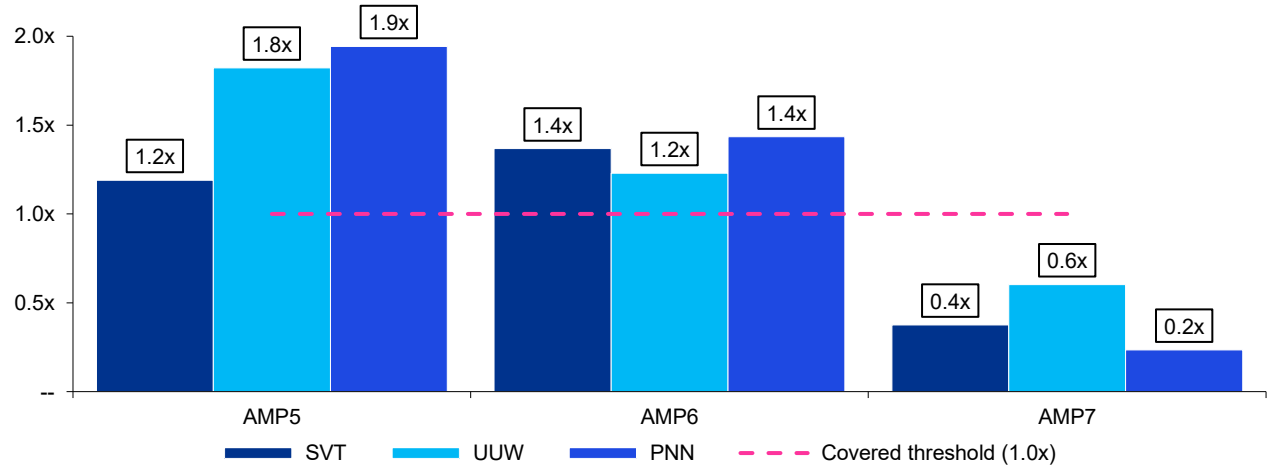
59. Equity investors in regulated utilities typically target stable equity returns and dividends over time.

60. However, there has been a trend of declining and increasingly volatile outturn equity returns, in particular, for AMP7[19]: (1) the average outturn return is lower than any previous AMP; (2) the average outturn return is below Ofwat's allowed return; and (3) the distribution of outturn returns is wider than any previous AMP.

61. In addition, the sector's ability to pay out dividends from outturn equity returns has been falling. The chart below shows the dividend cover[20] for the listed water companies (SVT, UUW and PNN) over the past three AMPs. The chart indicates a sharp move away from covering dividends from earnings in AMPs 5-6 to paying uncovered dividends in AMP7. This is not sustainable in the long run.

62. Investor confidence in the sustainability of dividends is to a degree linked to the ability to continuously pay dividends out of earnings. The sector's falling dividend cover further calls into question the investor expectation of water companies as dividend yielding stocks.

Figure 6: AMP average dividend cover for SVT, UUW and PNN over AMPs 5-7



Notes: AMP7 reflects 2021-2024.
Source: Southern Water analysis based on company annual reports[21].

63. Some companies have completely restricted dividends to investors since AMP6 to support their capital programme and financial resilience. For example, AFW has not paid a dividend since 2018[22] and we have not paid a dividend since 2017. GIIA commented in its response to the DD that: *"many of our members with stakes in the water sector have been unable to provide returns to the ultimate beneficiaries of their investment for years, many of which are pension savers"*[23].

[19] Oxera, August 2024, Investability at PR24: Final report for Water UK, pages 25-26, SOC-7-0002.
[20] Dividend cover = Profit after tax / dividends.
[21] Southern Water, March 2025, WACC Data book, worksheet "C_Figure 6", SOC-7-0001.
[22] Affinity Water , 2024, PR24 Draft Determination Representation, page 8, SOC-7-0014.
[23] GIIA, August 2024, Response to: Ofwat's PR24 Draft Determinations, page 3, SOC-7-0015.

GIIA's position in PR24

64. GIIA has made several representations through the PR24 process that capture the views of its members. Its position is summarised below and is discussed further in the appendix.

65. Over the last AMPs, there has been a focus on reducing UK water bills at the expense of even higher levels of investment required to improve infrastructure resilience and service reliability. Certain investments proposed by companies have been rejected and, even where accepted, companies have been asked to finance this at a WACC that in hindsight looks far too low for AMP7. This has eroded investor confidence.

66. Ofwat has failed to create an attractive case for this investment at PR24 as its risk-return ratio is out of line with investors' needs. This is due to (1) a return that is only marginally above risk-free rates and significantly below the returns available in other regulated sectors globally; and (2) a return that does not justify the higher risks in the sector such as the unstable regulatory environment and heightened operational challenges. This has shaken investor confidence in the sector, deterring the necessary new capital.

67. The consequence is that Ofwat may have again discouraged the investment the sector urgently needs as in previous price controls and 'kicked the can' to a later price control.

Water companies face a step-change in risk exposure on a forward-looking basis

68. Water companies face a step-change in risk exposure at AMP8 because:

- **Delivery risk:** The capital programme is ramping-up in terms of scale and complexity which are outside company control. This increases the risk of cost overruns and late delivery; and
- **Performance risk:** The PR24 regulatory framework imposes more stringent performance targets which increases the risk of ODI penalties.

69. Ofwat has introduced mechanisms to reduce risk. However, a number of mechanisms only apply in extreme scenarios and the mechanisms in aggregate are not sufficient to offset the step-change in delivery and performance risk. This reflects Ofwat's policy to *"…improve services to customers as the whole of the real allowed return on equity is at risk in the event of material underperformance"*[24].

70. The allowed return needs to reflect this material increase in risk for investors.

71. This view is shared by independent rating agencies, for example, S&P considers: *"AMP8 will, in our view, be a pivotal regulatory period for the sector, which will face many challenges in the upcoming five years. An all-time high capital program creates significant execution risks…"*[25].

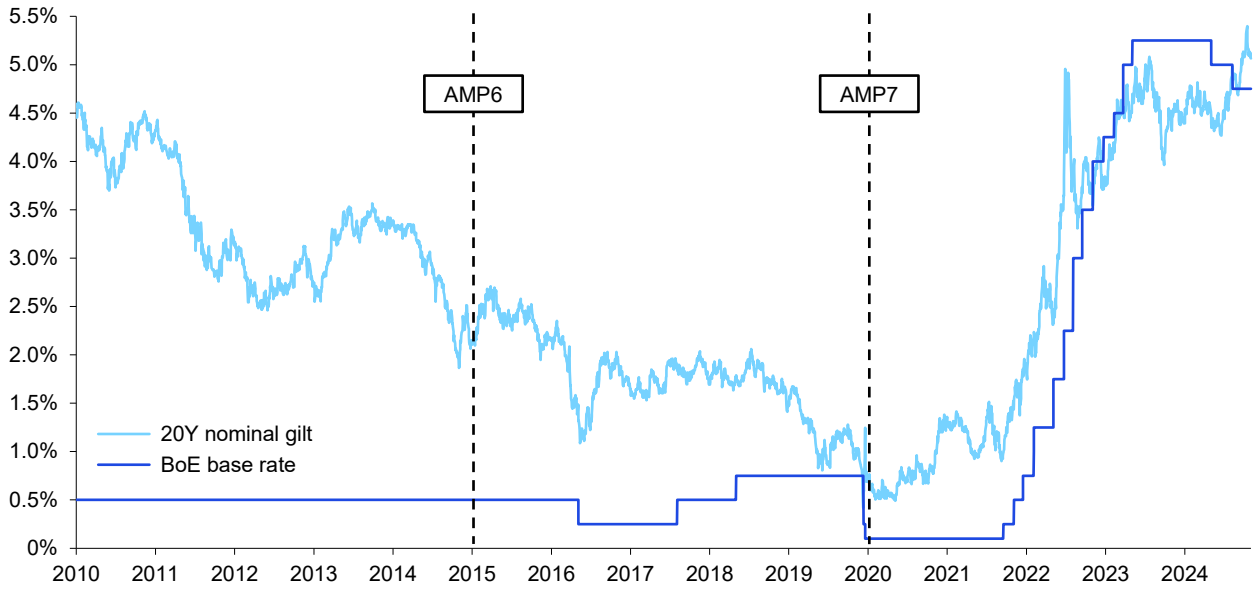
Interest rates are expected to stay 'higher for longer'

72. The allowed return for AMPs 6-7 were set at a time when interest rates were at an all-time low and thought as being 'lower for longer'. This enabled Ofwat to set the allowed return for AMPs 6-7 at

[24] Ofwat, December 2024, PR24 final determinations - Aligning risk and return – allowed return appendix, page 14, SOC-7-0005.
[25] S&P, February 2025, U.K. Water Regulatory Framework Support, Low Financial Flexibility In Coming Regulatory Period Drive Rating Actions, SOC-1-0013.

very low levels. However, market conditions have completely changed since the start of AMP7 as shown in the chart below.

Figure 7: Evolution of interest rates over AMP5-AMP7 (nominal)



Source: Southern Water analysis based on LSEG data[26].

73. Long-term interest rates have increased significantly and are expected to stay 'higher for longer' as the Bank of England has taken steps to normalise monetary policy. This in turn has pushed up the cost of debt and cost of equity across the entire market. Accordingly, the methodologies used to set the allowed return in AMPs 6-7 are not appropriate and should be adapted for market conditions in AMP8.

2.2.2 Implications for the allowed return

74. The factors in paragraph 29 can be grouped into two themes. Factors (1)-(2) highlight that the price of infrastructure capital has increased in AMP8 relative to previous AMPs. Factors (3)-(6) highlight that the risk for investors in the water sector has materially increased relative to previous AMPs.

75. These themes in combination demonstrate the need for a financeable allowance for AMP8 and mean such an allowance would be above that set in previous AMPs. To this end, the methodologies developed for previous AMPs should be adapted to ensure a financeable allowance is set for AMP8.

2.3 Company-specific issues for Southern Water at PR24 which have important implications for the allowed return

76. In 2023, we set out an ambitious Turnaround Plan to deliver a robust improvement in our performance over the last two years of AMP7. We have made significant progress, which Ofwat

[26] Southern Water, March 2025, WACC Data book, worksheet "C_Figure 7", SOC-7-0001.

has recognised; we were one of only two companies to reduce pollution incidents over 2022 to 2023 according to its review of industry performance[27].

77. Our shareholders have made an equity investment of £1.1bn in 2021 and an additional equity investment of £550m in 2023 to support the Turnaround Plan. Shareholders have not received a dividend since 2017 as we have continued to invest in our infrastructure. We have recently announced plans to raise a further £900m of equity from our shareholders to support our significant capital programme for AMP8.

78. Our Turnaround Plan ensures that we are on solid operational footing to deliver our plan for AMP8 and beyond. This is important as our plan for AMP8 is the most ambitious we have proposed to date. It builds on the improvements and positive momentum we have gained from our Turnaround Plan.

79. Our plan for AMP8 is ambitious in terms of scale and complexity. This is necessary to provide our customers with a resilient water service that serves them well into the future.

80. In terms of scale, our capital programme for AMP8 is higher relative to other companies, based on RCV growth. Our capital programme for AMP8 is over twice that in our current plan for AMP7.

81. In terms of complexity, the specific characteristics of our local region mean that our readily available raw water sources are reducing faster than for other companies[28]. First, climate change is reducing how much water we can extract from existing sources. This means that, for example, during droughts, which are becoming more frequent, there will not be as much water available from our existing sources. Second, we have to reduce how much water we extract from our extremely environmentally sensitive, existing chalk stream sources to protect the environment and meet regulatory requirements.

82. We have to develop new novel raw water sources to mitigate the impact of climate change and environmental restrictions on our water supply. Our plan for AMP8 includes a number of highly complex schemes to develop these new sources. For example: (1) new technologies to recycle wastewater and convert seawater into drinking water; and (2) major projects like pipelines to transfer water from other sources. As a result, our capital programme for AMP8 is more complex than for other companies.

83. The points above have important implications for the allowed return for Southern Water at AMP8.

84. First, our shareholders have already invested heavily but we need them to invest more to support our capital programme for AMP8. Further, our shareholders need to invest proportionately more than others in the sector at AMP8 as the scale of our capital programme is higher than for other companies. Shareholders need to have confidence that the allowed return will be set an at appropriate level; it cannot be expected that shareholders make unbounded investments at an inappropriate allowed return.

85. Second, as the scale and complexity of our capital programme is higher than for other companies, it is particularly important for Southern Water that the allowed return is set appropriately. The beta should reflect significant increases in delivery risk to which the sector as a whole and Southern Water in particular are exposed. The share of new debt should reflect the scale of debt financing

[27] Ofwat, October 2024, Water company performance report 2023-24, page 24, SOC-7-0016.
[28] See Chapter: Introduction to Southern Water

needed for our capital programme. The aiming-up should reflect any RoRE asymmetry for a notional company with our characteristics and capital programme.

86. Third, we are in the midst of our Turnaround Plan and it is imperative that AMP8 provides a platform for this to continue. An inappropriate allowed return could undo our significant progress and weaken our ability to achieve a successful turnaround at the pace we want and our customers expect. The consequences of setting an allowed return that does not allow us to complete our turnaround are potentially severe and other companies such as TMS provide a salutary warning of this.

3 Errors in Ofwat's approach to determining the allowed return at PR24 and our proposed remedies

3.1 Overview of Ofwat's allowed return methodology

Introduction

87. Ofwat sets the allowed return for the notional company. The notional company represents a hypothetical efficient water company. Ofwat's notional company is geared at 55% and achieves a rating of Baa1.

88. Companies finance themselves using equity and debt. Ofwat sets the cost of equity and cost of debt for the notional company separately. It weights these costs by notional gearing to calculate the allowed return.

89. Debt capital has a fixed term i.e. it has to be repaid on a certain date. The company must make mandatory interest payments over the fixed term to debt holders and these payments must be made ahead of those to equity holders. Equity is perpetual i.e. it does not have to be repaid. The company makes discretionary dividend payments to equity holders and these payments are made last in the company structure. It follows that equity capital is significantly riskier than debt capital and so the cost of equity is higher than the cost of debt.

90. The cost of debt is directly observable because the company contractually agrees an interest rate with debt holders in advance of taking on the debt. The cost of equity is not observable because no such contract exists between the company and equity holders. As a result, it is less straightforward to estimate the cost of equity than the cost of debt as the cost of debt can be informed by actual company data.

Cost of equity

91. Ofwat aims to set a cost of equity for the notional company that is forward-looking.

92. Ofwat estimates the cost of equity for the notional company primarily through use of the Capital Asset Pricing Model (CAPM). The CAPM estimates the cost of equity of a stock as:

Cost of equity = RFR + Beta * (TMR – RFR)

Where:

- RFR is the expected return of a risk-free asset;
- TMR is the expected return of the market portfolio; and
- Beta measures the stock's exposure to systematic risk relative to the market portfolio.

93. RFR and TMR are market-wide parameters while beta is asset-specific. Accordingly, the RFR and TMR for all stocks are the same, only beta drives differences in the cost of equity between stocks. This means that stocks with a similar exposure to systematic risk are expected to have a similar cost of equity.

94. As the cost of equity is not observable, there is inherent uncertainty in the estimates of the CAPM parameters. Ofwat sets ranges for each of the CAPM parameters to reflect this inherent uncertainty. This results in a range for the CAPM-implied cost of equity which can be relatively wide.

95. Ofwat uses a single cross-check (market-to-asset ratio) for the CAPM-implied cost of equity. It uses this to decide whether to set a point estimate for the cost of equity that differs from the midpoint of the CAPM-implied range.

Cost of debt

96. Ofwat sets the cost of debt for the notional company as follows:

Cost of debt = CoD_E * (1 - % new debt) + CoD_N * % new debt + CoD_A

Where:

- Cost of embedded debt is the cost of debt that was raised pre-AMP8 but remains active over AMP8;
- Cost of new debt is the cost of debt that will be raised over AMP8;
- Share of new debt reflects the quantum of new debt that has to be raised over AMP8; and
- Additional borrowing costs reflects costs associated with raising debt and maintaining liquidity.

97. As the cost of debt is observable, there is less inherent uncertainty in the estimate of the cost of debt. For this reason, Ofwat directly sets a point estimate for the cost of debt rather than a range.

Ofwat's position on the allowed return over the PR24 process

98. Ofwat in its PR24 Draft Methodology departed from the approach in the CMA's PR19 Redetermination and instead mostly reverted to that in its own PR19 final determination. Consequently, Ofwat's starting position for AMP8 was one which the CMA had already determined at PR19 to be inappropriately low. Ofwat continued to reflect this approach in its PR24 Final Methodology.

99. For the most part, Ofwat maintained this approach in its DD. Its DD has caused significant enduring damage to the sector as it confirmed investors' concerns that Ofwat's regulatory framework was not supportive of investment. For example, following the DD:

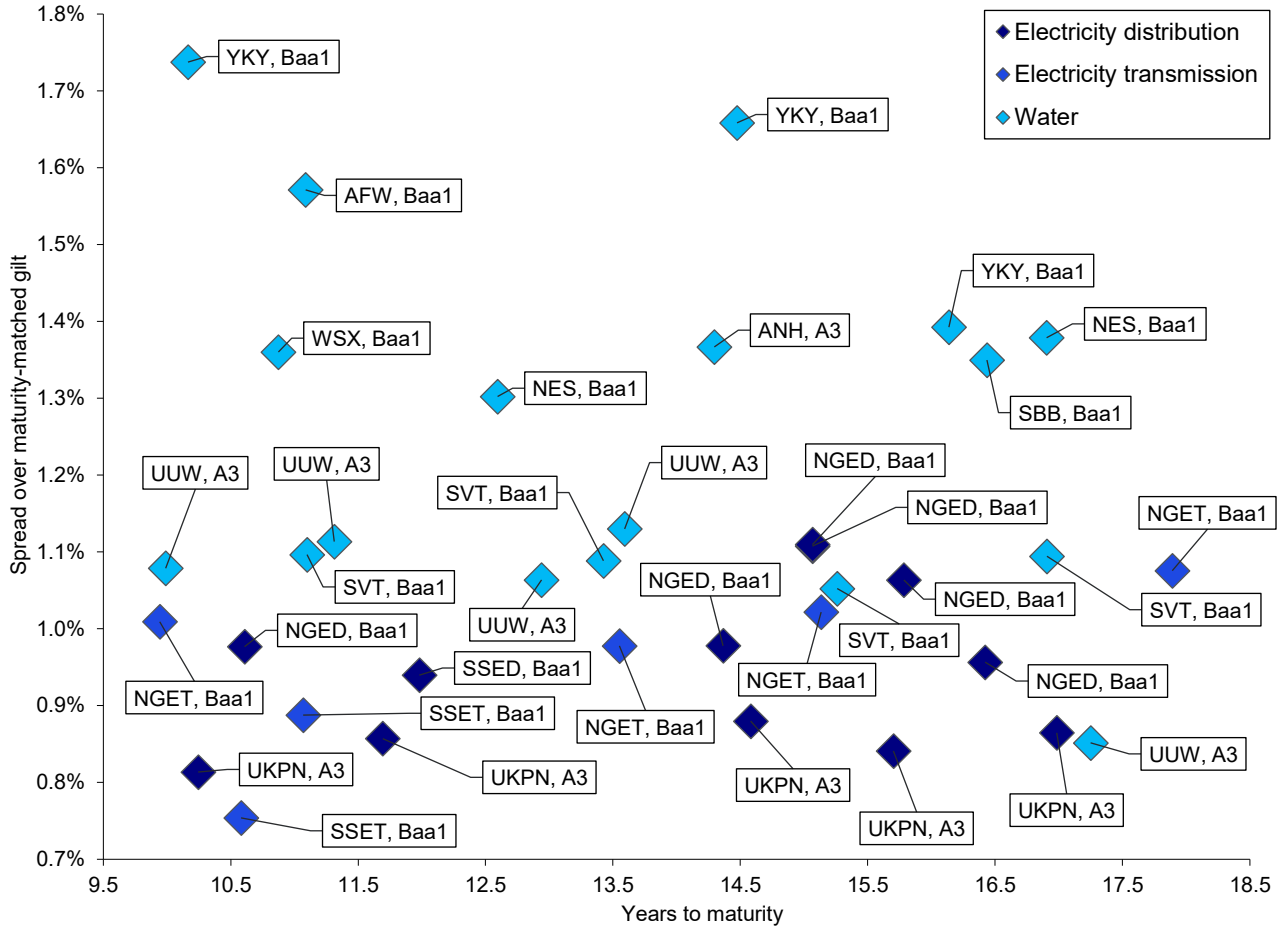
- Moody's downgraded its rating of Ofwat's framework as well as its ratings for several companies for this reason. Moody's commented that its downgrades would hold irrespective of Ofwat's FD because the FD would not alter current investor perceptions of risk in the regulatory framework[29]; and

- The spreads on water bonds increased to a level considerably higher than in comparable regulated sectors for the same reason. These spreads have narrowed since but remain elevated.

[29] Moody's, November 2024, Reduced predictability of regulatory environment pressures credit quality, page 2, SOC-1-0012.

100. The chart below presents spreads on OpCo water and electricity bonds in the iBoxx A/BBB 10Y+ index over January 2025[30]. The bonds in the chart have an effective rating of Baa1/BBB+ or A3/A- as at 31 January 2025[31]. The chart clearly demonstrates that water bonds have higher spreads than electricity bonds after controlling for rating and maturity. The difference between the sectors is more pronounced when outliers (SVT/UUW) are excluded. This means that investors perceive water to be riskier than electricity.

Figure 8: Spreads on water and electricity bonds in iBoxx A/BBB 10Y+ (nominal)



Source: Southern Water analysis based on LSEG data[32].

101. Ofwat's FD improved upon its DD in a few targeted areas, in particular, on the TMR and cost of new debt which resulted in a modest increase in the allowed return. However, there remains a wide gap between investors' required return and the allowed return because Ofwat's DD position was so low.

102. In response to the FD, S&P and Fitch downgraded their ratings of Ofwat's framework. S&P commented that *"UK water companies will operate in a less supportive regulatory environment*[33]*"* and Fitch commented that business risk for UK water companies has become *"moderately*

[30] Only includes water bonds for which a rating- and maturity-matched electricity bond can be found. Wrapped water bonds are excluded as the wrapping cost is not reflected in the bond yield.
[31] Effective rating reflects the average issue rating across Moody's, S&P and Fitch. UUW's effective ratings fell from A3/A- to Baa1/BBB+ on 29th January 2025 due to a downgrade from Moody's. UUW's effective ratings are considered A3/A- throughout January 2025 for the purposes of the chart.
[32] Southern Water, March 2025, WACC Data book, worksheet "C_Figure 8", SOC-7-0001.
[33] S&P, February 2025, U.K. Water Regulatory Framework Support, Low Financial Flexibility In Coming Regulatory Period Drive Rating Actions, SOC-1-0013.

higher"[34]. Moody's reaffirmed its view following the FD. It commented that *"the final determination, even if improved from the draft published in July 2024, does not provide an attractive risk-return balance for existing or new investors"*[35].

103. In sum, Ofwat made only a few methodological changes from its DM through to FD. Ofwat generally dismissed all evidence submitted by companies through the PR24 process. Further, Ofwat appeared to actively disincentivise companies from submitting evidence as it penalised companies that did not adopt its allowed return through its quality and ambition assessment[36].

Southern Water's position on the allowed return over the PR24 process

104. In our response to Ofwat's PR24 Draft Methodology, we emphasised that Ofwat materially deviated from the CMA's PR19 Redetermination and each of its deviations resulted in a lower allowed return. This did not, on the face of it, appear to be in line with a regulator seeking to identify the most robust calculation methodology. Rather, it appeared that Ofwat was seeking to adopt the lowest admissible estimate of the allowed return.

105. We provided our views in relation to Ofwat's methodology on each WACC parameter. These pointed to flaws in Ofwat's methodology where it was inconsistent with academic literature and market evidence.

106. We highlighted that Ofwat undermined financeability as a cross-check for the allowed return. Specifically, Ofwat assumed away the financeability challenge of reducing the allowed return and increasing risk for the notional company by reducing notional gearing.

107. In our Business Plan, we emphasised that Ofwat's PR24 Final Methodology cost of equity did not provide an equity risk premium over investment grade debt that was sufficient to draw equity investors. We highlighted that inference analysis could be used as a cross-check for the CAPM to ensure that Ofwat's cost of equity provided a sufficient equity risk premium over the yield of low risk debt.

108. We set out our estimate of the WACC which corrected for flaws in Ofwat's FM. In particular, our estimates of the beta reflected the forward-looking risks associated with our capital programme and the share of new debt reflected the scale of debt financing we needed for our capital programme. Further, we continued to challenge Ofwat's proposal to reduce notional gearing. This reduction increased risks to equity at a time where we need to attract significant amounts of new equity into the sector.

109. In our DD Response, we provided a KPMG report with a revised estimate of the WACC. This report showed that Ofwat's DD was materially understated based on flaws in its methodology and evidence from robust cross-checks. These cross-checks included alternative asset pricing models such as inference analysis, which was referenced in our Business Plan, and multifactor models.

110. KPMG presented its estimate of the cost of equity on a 55% gearing basis for comparability to Ofwat's DD and its preferred 60% gearing basis. We emphasised in our response to the PR24 Draft Methodology and again in our Business Plan that we similarly considered 60% gearing to be more appropriate than 55% gearing.

[34] Fitch, February 2025, Fitch Revises Osprey Acquisition's Outlook to Negative; Affirms Anglian Debt at 'A-', SOC-1-0015.
[35] Moody's, January 2025, Moody's Ratings downgrades Thames Water's CFR to Caa3, stable outlook, SOC-7-0018.
[36] Ofwat, December 2024, PR24 final determinations - Quality and ambition assessment summary, table 2, SOC-7-0007.

111. On reflection, we are concerned that Ofwat has not sought to refine its methodology substantively over the PR24 process to reflect the balance of the evidence, in particular, robust evidence from companies.

Data cut-off date used to estimate the WACC

112. Ofwat used a data cut-off date of September 2024 in the FD. Interest rates have risen significantly since September 2024 and remain volatile. For example, the 20Y ILG yield was 1.19% over September 2024 and has increased by 0.66% to 1.85% over January 2025 in RPI terms[37]. This means that Ofwat's allowed return in the FD is now out of date and in turn underestimates the prevailing required return of investors.

113. We have therefore estimated the WACC using a data cut-off date of January 2025 rather than September 2025. This is consistent with Ofwat's position that the latest data provides the best estimate for the future. Ofwat uses a 1m average of interest rates to estimate the risk-free rate and cost of embedded debt.

3.2 Cost of equity before aiming up

3.2.1 Summary of errors

114. Ofwat has arrived at an allowed return for equity that is inappropriately low because it has:

- Not properly reflected the quantity of risk in the water sector. Investors in the water sector face materially higher risks in AMP8 than in previous AMPs as highlighted in section 2.2.2; and
- Made technical errors in estimating cost of equity parameters. Ofwat's estimates of cost of equity parameters are inconsistent with academic literature and market evidence.

115. Ofwat's errors by cost of equity parameter are set out in table below. The table categorises whether each error relates to (1) or (2).

[37] Based on LSEG data.

Table 1: Ofwat's errors in estimating the allowed return on equity before aiming up

Parameter	Error no.	Error	Category of error
RFR	RFR error 1	RFR does not reflect that investors' risk-free borrowing rate is higher than their risk-free saving rate	Technical error
	RFR error 2	RFR does not reflect that ILGs benefit from the convenience yield which depresses their yield below the risk-free saving rate	
TMR	TMR error 1	TMR is based on historical ex-post estimates which assume serial correlation is present	Technical error
	TMR error 2	TMR is based on historical ex-post estimates which assume only the investor perspective is relevant	
	TMR error 3	TMR places weight on historical ex-ante estimates instead of placing sole weight on more reliable historical ex-post estimates	
Beta	Beta error 1	Beta does not place weight on PNN's beta which is more representative of the notional company and is higher than SVT/UUW	Technical error
	Beta error 2	Beta places excessive weight on periods in which large sections of the economy were shut and thus assumes such periods reoccur in AMP8	
	Beta error 3	Beta does not reflect the expected increase in risk for AMP8, particularly under our plan, and instead implies risk has reduced relative to AMP7	Quantity of risk
RMA	RMA error 1	RMA does not reflect that the retail business is integrated with the wholesale business and therefore should be financed with equity to avoid appointee gearing increasing above the notional level. At a minimum, the retail business should be financed at the appointee WACC	Technical error
	RMA error 2	RMA accounts for the revenue on DPC and SIPR assets but not the cost of financing these fixed assets	

Source: Southern Water analysis.

3.2.2 Risk-free rate

116. The risk-free rate in the CAPM represents the rate of return expected by investors for holding a risk-free asset i.e. an asset with zero risk.

The ILG yield as starting point for the risk-free rate

117. Ofwat's starting point for the risk-free rate is the 1m trailing average of 20Y RPI index linked gilt (ILG) yields. We do not contest that this is a reasonable starting point because:

- Government bonds, such as gilts, are the real world equivalent of the CAPM risk-free asset. This is because investors generally perceive these as risk-free and these are the safest alternative to investing in the market portfolio. Given Ofwat sets a real allowance, it is a more

direct approach to rely on ILGs rather than nominal gilts (NGs) for the risk-free rate. This is also in line with UKRN guidance[38];

- 20Y tenor broadly matches the long asset lives in the sector and the reality of decision-making that Ofwat requires for the sector. Further, 20Y tenor closely matches the tenor of Ofwat's benchmark index for the cost of new debt which maintains consistency across the allowed return. 20Y tenor is also in line with the CMA PR19 Redetermination[39] and Ofgem's RIIO-3 SSMD[40] on the risk-free rate; and

- Outturn rates for 20Y ILGs have been rising over the past year. Forward rates for 20Y ILGs (and NGs) suggest the market expectation is for the spot rates on these instruments to increase further. As Ofwat has decided against indexation, 1m trailing average should be used. This would minimise the loss to investors vs longer trailing averages if the market expectation was to materialise in practice.

118. The appropriate risk-free free rate for the CAPM lies above the ILG yield because (1) investors cannot borrow at the ILG yield; and (2) ILGs benefit from the convenience yield (**CY**). Such adjustments are in line with academic literature on the risk-free rate. Ofwat has, in error, failed to make these appropriate adjustments.

119. In addition, Ofwat has wrongly conflated these two adjustments. Importantly, these are conceptually separate and necessary. The CMA in its PR19 Redetermination adjusted for the first but not directly for the second.

RFR error 1: Investors cannot borrow at the ILG yield

120. The standard CAPM assumes that investors can borrow and save at the same risk-free rate. However, in the real world, the risk-free borrowing rate is higher than the risk-free saving rate. In this case, the appropriate risk-free rate for the CAPM lies between the two rates as shown by Brennan (1971)[41].

121. Such an approach is consistent with the CMA's PR19 Redetermination, where the CMA viewed its approach of basing the risk-free rate on both ILGs and AAA corporate bonds to be an application of Brennan (1971)[42]. In particular, the CMA used ILGs as a proxy for the risk-free saving rate and AAA corporate bonds as a proxy for the risk-free borrowing rate.

122. Ofwat in error does not apply the Brennan framework. Ofwat sought to justify this approach on the basis that: (1) it is not aware of the framework being used in other regulatory jurisdictions; and (2) it considers the framework is rarely used in asset pricing.

123. On (1), this should not be a reason for dismissing the Brennan framework. The Brennan framework represents an improvement on Ofwat's approach given the empirical reality that borrowing and lending rates differ. A regulator should seek to be a thought leader and implement best practice.

[38] UK Regulators Network, March 2023, Guidance for regulators on the methodology for setting the cost of capital, page 15, SOC-7-0019.
[39] CMA, September 2020, Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations - Provisional findings, para 9.128, SOC-7-0020.
[40] Ofgem, July 2024, RIIO-3 Sector Specific Methodology Decision – Finance Annex, paras 3.37-3.38, SOC-7-0021.
[41] Brennan, December 1971, Capital Market Equilibrium with Divergent Borrowing and Lending Rates, SOC-7-0022.
[42] CMA, March 2021, Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations - Final report, para 9.263, SOC-7-0023.

124. In any case, other UK regulators such as the CAA[43] and UREGNI[44] have adopted the Brennan framework in their most recent determinations. European regulators such as BNetzA[45] (German) and ARERA[46] (Italian) have also implicitly adopted the same framework by estimating the risk-free rate using government and corporate bonds.

125. On (2), the Brennan framework is covered in standard corporate finance textbooks for practitioners[47] which means it is well accepted and best practice for asset pricing.

126. In addition, Ofwat wrongly considers that provided the marginal investor in water is a net lender, the risk-free borrowing rate is irrelevant.

127. First, whilst the current investors in water may be net lenders, it should not be assumed that the marginal investor is the same. The current investors in water generally do not adjust their holdings whereas the marginal investor is one whose demand is most sensitive to small changes in price. Hedge funds are often considered to be the marginal investor for this reason and hedge funds borrow[48].

128. Second, the higher cost of capital for the current investors in water is not due to facing the risk-free borrowing rate themselves. It is to compensate them for being overweight on water compared to the market portfolio and therefore not being fully diversified.

RFR error 2: ILGs benefit from CY

129. CY is explored across two steps.

> *Assume, as a simple benchmark, that investors can borrow and save at the same risk-free rate as in the standard CAPM.*

130. The risk-free rate is used as a measure of the time value of money: the required return for receiving a riskless payoff in the future instead of today.

131. Ofwat has used the ILG yield for this benchmark. However, government bonds provide additional benefits to investors such as the ease with which they can perform money-like roles. These benefits create additional investor demand for government bonds and push their return below that implied by the time value of money alone. The difference is CY.

132. It is not only government bonds that bear CY; take physical cash as another example. Physical cash (notes and coins) and cash held in a bank account are both risk-free. However, physical cash earns no return whereas cash held in a bank account earns the deposit rate i.e. physical cash bears CY. This is because physical cash has a superior ability to perform money-like roles as it can be spent immediately. Rational investors are willing to pay for this convenience of physical cash.

[43] CAA, March 2023, Economic regulation of Heathrow Airport Limited: H7 Final Decision - Section 3 Financial issues and implementation, paras 9.12 and 9.41, SOC-7-0024.; and CAA, October 2023, Economic Regulation of NATS (En Route) plc: Final Decision for the NR23 (2023 to 2027) price control review, paras 5.64 and 5.86, SOC-7-0025.
[44] Utility Regulator, October 2022, GD23 - Gas Distribution Price Control 2023-2028 - Final determination main report, para 10.17, SOC-7-0026.; and Utility Regulator, October 2024, Northern Ireland Electricity Networks Ltd - Transmission and Distribution 7th Price Control (RP7) - Final determination main report, para 13.57, SOC-7-0027.
[45] Bundesnetzagentur, Determination of equity interests rates for 1st to 4th regulatory periods, SOC-7-0028.
[46] ARERA, Rate of return for electricity and gas sectors for the period 2022-2027, SOC-7-0029.
[47] Such as Berk and DeMarzo, 2014, Corporate Finance, SOC-7-0030.; and Brealey, Myers, Allen and Edmans , December 2025, Principles of Corporate Finance - Part Two Risk - Chapter 8-22, SOC-7-0031.
[48] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 4.3.54, SOC-7-0034.

133. It follows that for ILGs, CY(ILG) must be added to their return to obtain the risk-free rate.

134. Ofwat has acknowledged that CY could exist but in error does not adjust for CY(ILG)[49]. It cites quantitative concerns as its rationale for taking this approach which we address below.

> *Now consider the more realistic case that investors' risk-free borrowing rate exceeds their saving rate.*

135. The saving rate is equal to the common risk-free rate in the previous world but the borrowing rate increases.

136. The saving rate remains ILG yield plus CY(ILG). The borrowing rate now becomes ILG yield plus CY(ILG) plus borrowing costs. These borrowing costs relate to e.g. the transaction costs and collateral requirements associated with borrowing.

137. The CMA's estimate of the risk-free saving rate is the ILG yield. However, a more complete estimate is the ILG yield plus CY(ILG) as this explicitly takes into account the presence of CY.

138. The CMA's estimate of the risk-free borrowing rate is the AAA corporate borrowing rate. This rate is very close to but is not completely risk-free. However, it represents the lowest possible (and likely understated) cost at which investors can borrow in practice and is thus the best estimate for the risk-free borrowing rate.

139. In this respect, Brealey, Myers, Allen, and Edmans (2025) write that: *"A common benchmark for…the borrowing rate, is the yield on high-quality (e.g., AAA- or AA-rated) corporate bonds. However, the rate at which investors can borrow may be even higher than for companies, because financial assets are often more volatile than corporate assets such as buildings and machines"*[50].

140. For completeness, it is not possible to identify the risk-free saving rate either where there is no risk-free asset, or the risk-free asset bears CY which cannot be estimated. In either case, the risk-free saving rate should be replaced with the return on a zero-beta asset as shown by Black (1972)[51]. In turn, the risk-free borrowing rate should be replaced with the return on a zero-beta plus shorting costs.

141. The zero-beta asset bears no systematic risk whereas the risk-free asset bears no risk. Hence, the return on the zero-beta is higher than the risk-free asset as the former bears idiosyncratic risk. In consequence, the zero-beta route to finding the benchmark yield for the CAPM is still higher than the ILG yield.

Quantification of adjustments to the ILG yield – AAA-ILG

142. It follows that the lower bound adjustment to the ILG yield is based on CY(ILG) and the upper bound adjustment on the difference in yield between AAA bonds and ILGs (AAA-ILG).

143. KPMG has quantified these adjustments[52].

[49] Ofwat, December 2022, Creating tomorrow, together: Our final methodology for PR24 Appendix 11 Allowed return on capital, page 15, SOC-7-0032.
[50] Brealey, Myers, Allen and Edmans , December 2025, Principles of Corporate Finance - Part Two Risk - Chapter 8-22, SOC-7-0031.
[51] Black, July 1972, Capital Market Equilibrium with Restricted Borrowing, SOC-7-0033.
[52] KPMG, March 2025, Estimating the Cost of Capital for PR24, section 4.4, SOC-7-0034.

144. KPMG estimated AAA-ILG directly based on the difference in yield between RPI AAA bonds and duration-matched ILGs. It focused on the 1m average over January 2025 as this reflects the latest data and therefore may provide the most reliable estimate. This produced an estimate of 67bps.

145. It also considered the long-term average to ensure the 1m average was not affected by temporary factors which pointed to 137bps. As the 1m average was based on more reliable data than and is below the long-term average, KPMG selected the 1m average of 67bps as the point estimate for AAA-ILG.

146. KPMG highlighted that as the AAA corporate borrowing rate is the lowest possible estimate of the risk-free borrowing rate, an adjustment of at least 67bps is required[53].

147. Berk and DeMarzo (2020) indicates even collateral-rich investors have to borrow at a premium over government rates (c.1%) that is above that implied by the AAA corporate borrowing rate (67bps)[54]. This shows empirically that the AAA corporate borrowing rate likely understates the risk-free borrowing rate.

148. Ofwat dismissed the RPI AAA bond analysis as it considered the data for the RPI AAA bonds may be unreliable[55]. KPMG has shown that its point estimate for the AAA-ILG is based on data that firmly surpasses Bloomberg's threshold for reliability and therefore that Ofwat's concern is no longer valid[56].

Quantification of adjustments to the ILG yield – CY(ILG)

149. KPMG commented that recent academic literature has estimated CY for 2Y NGs as 29bps based on a data cut-off date of July 2020[57]. It developed quantitative analysis that aimed to estimate equivalent CY for 2Y ILGs from this, which pointed to 2bps. It considered that CY for 2Y ILGs sits within the range of 2-29bps. This is because it undertook qualitative analysis that found that the majority of CY factors cited in academic literature apply similarly to NG/ILGs but NGs may be more liquid. The range reflects this finding.

150. KPMG showed that the bounds of the range are likely to be higher based on a more recent data cut-off. As such, it considered that it did not appear appropriate to place excessive weight on the lower bound. For this reason, it selected the midpoint of the range of 15.5bps as the point estimate for CY for 2Y ILGs[58].

151. Ofwat has recognised the estimates of CY for 2Y NGs from academic literature[59]. However, it wrongly considers that these estimates of CY for shorter-dated safe assets cannot be extrapolated to longer-dated safe assets. As Ofwat sets the risk-free rate at the 20Y horizon, it does not apply an adjustment for CY.

152. KPMG explained that empirical and qualitative evidence shows it is reasonable to assume that CY holds for longer-dated safe assets[60]. First, the term structure of CY in academic literature is mostly

[53] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 4.4.22, SOC-7-0034.
[54] Berk and DeMarzo, December 2020, Corporate Finance - page 440, SOC-7-0035.
[55] Ofwat, December 2024, PR24 final determinations - Aligning risk and return – allowed return appendix, page 13, SOC-7-0005.
[56] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 4.4.19, SOC-7-0034.
[57] W. Diamond et al., January 2025, Risk-Free Rates and Convenience Yields Around the World, SOC-7-0036.
[58] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 4.4.31, SOC-7-0034.
[59] Ofwat, December 2022, Creating tomorrow, together: Our final methodology for PR24 Appendix 11 Allowed return on capital, page 15, SOC-7-0032.
[60] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 12.1.30, SOC-7-0034.

upward sloping. Second, CY is driven in part by the usefulness of safe assets as collateral. The collateral value component of CY for longer-dated safe assets is at least the same as that for shorter-dated safe assets.

153. Drawing on this evidence, KPMG adopted 15.5bps as the point estimate for longer-dated ILGs. It also developed a cross-check for this using RPI AAA bonds based on earlier academic literature on CY which implied a significantly higher value than 15.5bps[61].

Quantification of adjustments to the ILG yield – point estimate

154. KPMG adopted a range of 15.5-67bps for the adjustment required to the ILG yield[62]. 15.5bps is the minimum adjustment required to derive the risk-free saving rate and 67bps is the same for the risk-free borrowing rate.

155. Brennan (1971) states that the risk-free rate for the CAPM is a weighted average of the risk-free borrowing and saving rates; however the theoretical weights cannot be translated into empirical measures. The CMA in its application of Brennan (1971) at PR19 determined the risk-free rate for the CAPM to be the midpoint of its estimates of the risk-free borrowing and saving rates[63]. In this context, KPMG selected the midpoint of its estimates of the same which resulted in an adjustment to the ILG yield of 41bps.

156. Ofwat appears to consider that it is not possible to robustly estimate CY at longer tenors and therefore identify the risk-free saving rate. If this is the case, Ofwat should have followed the zero-beta route to finding the benchmark yield for the CAPM. Di Tella et al. (2023) indicates that the adjustment to the ILG yield based on the zero-beta route would be significantly higher than KPMG's 41bps[64].

RPI-CPIH wedge

157. Ofwat estimated an RPI-CPIH wedge by placing equal weight on forecasts for the RPI-CPI wedge from inflation swaps and official forecasters. These forecasts were at the 20Y horizon reflecting that Ofwat's starting point for the risk-free rate was 20Y ILGs. Owat used CPI as a proxy for CPIH as it considered that the CPI-CPIH wedge is generally small. KPMG considers that Ofwat's approach appears reasonable.

158. KPMG has updated Ofwat's approach to reflect a data cut-off date of January 2025; this points to an RPI-CPIH wedge of 0.32%.

Proposed remedy

159. Ofwat has in error failed to make appropriate and necessary adjustments to 20Y ILG yield to arrive at the risk-free rate. KPMG has undertaken analysis that corrects these errors.

160. KPMG's starting point for the risk-free rate is the 1m average of 20Y ILG yields like Ofwat.

[61] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 4.4.41, SOC-7-0034.
[62] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 4.4.72, SOC-7-0034.
[63] CMA, March 2021, Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations - Final report, para 9.265, SOC-7-0023.
[64] S. Tella et al , August 2023, The zero-beta interest rate, SOC-7-0037.

161. KPMG has adjusted the ILG yield for CY and AAA-ILG to derive the risk-free rate range in line with academic literature. The lower bound of the risk-free rate range should reflect the ILG yield plus CY(ILG) and the upper bound should reflect the ILG yield plus AAA-ILG.

162. KPMG estimated a point estimate for CY(ILG) of 15.5bps and AAA-ILG of 67bps. It selected the midpoint of 41bps as the point estimate for the adjustment to the ILG yield following the CMA's PR19 Redetermination.

163. The 1m trailing average of 20Y ILG yields over January 2025 is 1.85%. This implies a range for the risk-free rate of 2.01% to 2.52% with a point estimate of 2.26% in RPI terms.

164. Applying the 20Y RPI-CPIH wedge of 0.32% results in an overall range for the risk-free rate of 2.33%-2.85% with a point estimate of 2.59% in CPIH terms. We request that the CMA redetermines the risk-free rate in line with KPMG's point estimate.

3.2.3 Total market return (TMR)

165. The TMR in the CAPM represents the rate of return expected by investors for holding the market portfolio.

166. Ofwat has estimated a range for the TMR based on historical ex-ante and ex-post approaches. The historical ex-post approach is based on the long-run average of returns. The historical ex-ante approach is based on the long-run average of adjusted returns, where the adjustment accounts for 'surprise' events that generated a higher or lower return than expected.

167. Ofwat's application of the historical ex-ante approach is correct but its application of the historical ex-post approach is in error. In particular, it has used 10Y and 20Y overlapping averages instead of 1Y arithmetic average for the historical ex-post approach.

168. The use of 1Y arithmetic average is the default position as recognised by corporate finance textbooks and academic literature[65]. This position should only be departed from if it is proven there are strong reasons to do so. Ofwat's reasons for departing from this position were that: (1) there is serial correlation present in UK equity returns data; and (2) the TMR should be estimated from the perspective of only investors and not capital budgeters[66]. However, these reasons are flawed as set out below.

TMR error 1: Serial correlation

169. Serial correlation means that returns are correlated with each other i.e. they are not random.

170. Ofwat considers that returns are serially correlated, citing the serial correlation coefficient value for UK equity returns from DMS 2024. This is in error (i.e. there is no serial correlation in returns) for the reasons set out below.

171. First, in conventional statistical testing, the null hypothesis is that there is no serial correlation and the presence of serial correlation must be proven. Ofwat's position is inconsistent with this conventional approach; its null hypothesis is that there is serial correlation and this must be

[65] Such as S. Schaefer , April 2020, Comments on CMA views on Estimating Expected Returns, SOC-7-0038.
[66] Ofwat, December 2024, PR24 final determinations - Aligning risk and return – allowed return appendix, pages 32-34, SOC-7-0005.

disproven. In any case, KPMG shows that the serial correlation coefficient from DMS 2024 is not statistically significant[67] and therefore has disproven Ofwat's null hypothesis.

172. Ofwat has dismissed this evidence from KPMG on the basis of its view that statistical tests are of limited use for detecting serial correlation[68]. It is inconsistent for Ofwat to cite the serial correlation coefficient as its principal evidence of serial correlation but to then dismiss the statistical significance of the coefficient: both the coefficient and the statistical significance thereof derive from statistical analysis. This is especially egregious given that Ofwat has used the serial correlation coefficient as a justification to replace the conventional null hypothesis that there is no serial correlation in returns.

173. Second, Ofwat highlights that if the returns were entirely uncorrelated, the variance of the series may be higher than observed. However, the observed variance falls within the 95% confidence interval for a series without serial correlation which Ofwat has acknowledged[69]. As such, the observed variance does not provide sufficient evidence to conclude that serial correlation is present.

174. Third, Ofwat considers that the use of the long-term average of historical returns to estimate the TMR is necessarily predicated on the existence of a degree of serial correlation. This is not the case. In actuality, the principal reason for using historical returns to estimate the TMR is that these returns represent a reasonable expectation of future performance.

175. Fourth, as regards the practice of other regulators, it is notable that Ofgem, having previously considered at RIIO-2 that returns may be serially correlated, changed its approach at RIIO-3. In the RIIO-3 SSMD, Ofgem adopted the default position (1Y arithmetic average) for its ex-post approach[70].

176. Overall, the evidence presented above clearly shows that there is no serial correlation in returns i.e. they are random. Accordingly, there is no valid reason to depart from the default position.

TMR error 2: Investors and capital budgeter perspectives

177. The estimate of the TMR differs depending on whether it is estimated from the perspective of investors (provider of capital) or capital budgeters (users of capital).

178. Ofwat considers that only the investor perspective is relevant as the primary objective of the allowed return is to secure investment[71]. However, this fails to recognise that the allowance serves a purpose for both investors and capital budgeters: (1) it supports investors with asset allocation decisions; and (2) it supports companies with financial planning. Both perspectives are relevant and so warrant equal weight which the CMA recognised in its PR19 Redetermination[72].

179. Ofwat additionally considers that capital budgeters use a company-specific WACC rather than the allowance for financial planning. As such, the allowance need not accommodate the perspective of capital budgeters. This is in error for the reasons set out below.

180. First, the allowance represents the WACC for the notional company. It follows that for the notional company, its company-specific WACC and the allowance are the same. In consequence,

[67] KPMG, March 2025, Estimating the Cost of Capital for PR24, paras 5.1.7 and 5.1.14, SOC-7-0034.
[68] Ofwat, December 2024, PR24 final determinations - Aligning risk and return – allowed return appendix, page 32, SOC-7-0005.
[69] Ofwat, December 2024, PR24 final determinations - Aligning risk and return – allowed return appendix, page 33, SOC-7-0005.
[70] Ofgem, July 2024, RIIO-3 Sector Specific Methodology Decision – Finance Annex, paras 3.120 and 3.123, SOC-7-0021.
[71] Ofwat, December 2024, PR24 final determinations - Aligning risk and return – allowed return appendix, page 34, SOC-7-0005.
[72] CMA, March 2021, Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations - Final report, para 9.328, SOC-7-0023.

introducing a distinction between the company-specific WACC and the allowance is inappropriate under a notional framework.

181. Second, both actual companies and investors use the company-specific WACC. For actual companies, they use it for the purpose of financial planning as described by Ofwat. For investors, the difference between the allowance and the company-specific WACC is an important factor in their asset allocation decision-making. In consequence, it is inappropriate to disregard the perspective of capital budgeters on the basis of their use of the company-specific WACC since it is used by investors and capital budgeters.

182. The evidence shows that both the investor and capital budgeter perspectives are relevant. In this case, the estimate should not prioritise either perspective as shown in Schaefer (2020). Accordingly there is no reason to depart from the default position. For context, Schaefer (2020) explains that the default position represents the 'neutral' rate and as such is not biased towards any particular perspective.

183. As there are no reasons to depart from the default position, KPMG has adopted the default position for the historical ex-post TMR[73]. It estimates an historical ex-post TMR of 6.93% based on the default position.

TMR error 3: Historical ex-ante vs ex-post approaches

184. The historical ex-ante and ex-post approaches both use the long-run average of returns. The historical ex-ante approach is less reliable than the historical ex-post approach.

185. First, the historical ex-ante approach adjusts outturn returns for 'surprise' events to derive expected returns. These adjustments are subjective and heavily reliant on assumptions. In contrast, the historical ex-post approach uses outturn returns directly and therefore does not require such adjustments.

186. Second, the assumptions used in the adjustments for the historical ex-ante approach can be volatile and challenging to interpret. For example, the adjustments make use of dividend growth which is highly volatile and dividend yields which are challenging to interpret. As a result, the historical ex-ante approach generates ranges for the TMR that are significantly wider than the historical ex-post approach.

187. KPMG estimates an historical ex-ante TMR of 6.68-6.82%[74] and an historical ex-post TMR of 6.93%. As the historical ex-ante approach is less reliable than the ex-post approach, KPMG has selected the historical ex-post estimate as its point estimate for the TMR[75].

TMR glider

188. Frontier Economics observed that regulators have reduced their estimates of the TMR in response to falling gilt yields over the past 10Y[76]. Regulators have reduced the TMR only by a proportion of the fall in gilt yields i.e. not one-for-one. This 'stable but not fixed' policy is in line with UKRN guidance.

[73] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 5.1.11, SOC-7-0034.
[74] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 5.2.3, SOC-7-0034.
[75] KPMG, March 2025, Estimating the Cost of Capital for PR24, paras 5.3.3 – 5.3.7, SOC-7-0034.
[76] Frontier Economics, November 2024, Updated cost of equity cross-check evidence, pages 40-45, SOC-7-0039.

189. Frontier Economics found that academic literature supports the UKRN guidance. It followed the academic literature to develop a model for inferring the TMR from gilt yields. In line with the academic literature, it used a Dividend Discount Model to estimate the expected TMR over 2006-2023. It regressed these estimates of the TMR against 20Y NG yields to obtain a line of best fit. It refers to this line as the 'TMR glider'.

190. Frontier Economics tested the glider against regulatory decisions taken since 2012. It concluded that the glider is able to explain past regulatory TMR decisions given the regulatory RFR decisions, reasonably well. This affirms that the prevailing UKRN guidance accurately represents past regulatory decisions.

191. The glider has not previously been considered by UK regulators. However, Frontier Economics comments that it is a valuable cross-check for the TMR because: (1) it is supported by academic literature and UKRN guidance; and (2) it explains regulatory precedent on TMR; and (3) it objectively infers TMR from gilt yields.

192. The gilder implies a TMR of 7.77-7.95% based on current gilt yields[77]. This is higher than the TMR in regulatory precedent because current gilt yields are elevated relative to the past 10Y.

193. The glider-implied TMR is higher than the estimate of TMR based on the long-run average of returns. This indicates that the estimate of TMR based on the long-run average of returns is conservative.

Proposed remedy

194. Ofwat has erred in estimating the TMR as it has placed weight on the historical ex-ante approach and has departed from the default position (1Y arithmetic average) for the historical ex-post approach. KPMG has undertaken analysis that corrects these errors.

195. KPMG has estimated the historical ex-ante TMR broadly in line with Ofwat. Ofwat's range of 6.68-6.91% is slighter higher than KPMG's range of 6.68-6.82%. However, KPMG do not place weight on the historical ex-ante TMR as the historical ex-post TMR is more reliable.

196. KPMG has estimated the ex-post TMR using the default position as it has shown that Ofwat's reasons for departing from the default position are flawed. KPMG's estimate of the ex-post TMR is 6.93%.

197. KPMG has selected the ex-post TMR of 6.93% as its point estimate. We request that the CMA redetermines the TMR in line with KPMG's point estimate.

198. The TMR glider implies a TMR of 7.77-7.95% based on current gilt yields. This suggests that KPMG's point estimate based on the long-run average of returns is conservative.

3.2.4 Beta

199. Beta measures a stock's exposure to systematic risk *relative* to the entire market.

[77] Frontier Economics, November 2024, Updated cost of equity cross-check evidence, page 50, SOC-7-0039.

200. Systematic risk is driven by macroeconomic factors and therefore affects the entire market, meaning that investors cannot avoid it through diversification. A beta of one means that a stock's exposure to systematic risk is the same as that of the entire market. Equivalently, it means that a stock's return on average moves in line with that of the entire market.

201. The beta for AMP8 is estimated in two stages. The first stage estimates the BAU beta which reflects a water stock's normal exposure to systematic risk. The second stage adjusts the BAU beta to estimate a forward-looking beta which reflects a water stock's forward-looking exposure to systematic risk at AMP8.

Beta error 1: BAU beta – Pennon data

202. Ofwat has based its estimate of the beta on data from two of the three listed water companies, namely, SVT and UUW. As such, Ofwat has treated SVT/UUW's exposure to systematic risk as a proxy for the notional company's exposure to the same.

203. Ofwat's proxy for the notional company is the average company. This is because it has sought to structure the average company's exposure to risk to mirror that of the notional company. In particular, it has allocated risk such that the average company neither out- nor under-performs like the notional company.

204. SVT and UUW are the strongest operational performers in the sector under Ofwat's regime, for example, they are the only companies that have met Ofwat's performance targets in AMP7. In addition, they have the cheapest debt costs in the sector which means Ofwat's cost of debt allowance overfunds their debt costs.

205. SVT and UUW are amongst the largest WaSCs. The CMA has recognised that for larger companies, a higher proportion of their revenues are tied to operating cashflows (allowed return and depreciation) than smaller companies[78]. In other words, larger companies have lower operational gearing than smaller companies. This means that larger companies have more of a margin to deal with cyclical profit fluctuations.

206. It follows that SVT and UUW are therefore the lowest risk companies in the sector.

207. The rating agencies recognise that SVT and UUW are the lowest risk companies in the sector in their rating assessments. For example, Fitch tightened its gearing thresholds for the sector but not for UUW "*because UUW is a positive outlier in the sector*"[79]. S&P's ratings for SVT and UUW incorporate a positive adjustment to reflect their uniquely strong operational and financial performance in AMP7 and favourable FD[80].

208. The same is recognised by investors in debt markets. KPMG has found that bonds issued by SVT/UUW have secondary market yields consistently below that of other water bonds at the same Moody's rating and maturity[81].

[78] Competition Commission, February 2010, Notice of Reference: Determination of Adjustment Factor for the period 2010- 2015, Appendix N, paras 129 and 137, SOC-7-0040.
[79] Fitch, February 2025, Fitch Affirms UUW's Senior Unsecured at 'A-'; Downgrades UU's Senior Unsecured to 'BBB+', SOC-7-0041.
[80] S&P, February 2025, U.K. Water Regulatory Framework Support, Low Financial Flexibility In Coming Regulatory Period Drive Rating Actions, SOC-1-0013.
[81] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 6.3.6, SOC-7-0034.

209. In consequence, SVT and UUW are, in isolation, inappropriate proxies for the notional company. This is because as the lowest risk companies in the sector, they do not reflect the average company. Accordingly, SVT/UUW should not in isolation be used to proxy the notional company's exposure to systematic risk.

210. PNN is the third listed water company. PNN data should be reflected in the estimate of the beta to improve the accuracy of the estimate. This is because PNN provides an additional datapoint beyond just SVT/UUW and is more representative of the average company in terms of performance and size than SVT/UUW.

211. PNN has been a "pure play" water company since the sale of its waste management business, Viridor, in July 2020. Pure play PNN's 2Y beta has been significantly higher than that for SVT/UUW. This demonstrates that PNN has higher exposure to systematic risk than SVT/UUW.

212. PNN's 10Y beta diverged from that of SVT/UUW since around 2019 and the gap between PNN and SVT/UUW did not noticeably narrow following the sale of Viridor. This suggests that PNN's higher exposure to systematic risk is not related to Viridor. Structural break analysis supports this conclusion; it shows that the sale of Viridor did not cause a statistically significant reduction to PNN's 10Y beta[82].

213. As such, it is correct to use PNN data both prior to and after the sale of Viridor in the estimate of the beta i.e. before PNN became pure play and after it did so. KPMG has adopted this approach in its estimate of the BAU beta. KPMG combines 10Y beta data from PNN as well as SVT/UUW to estimate the BAU beta[83].

214. Ofwat has in error excluded PNN data from its estimate of the beta. Ofwat's rationale for excluding PNN data and the flaws in this rationale are covered in turn below.

215. Ofwat suggests that PNN's historical enterprise value (EV) gearing may understate its expected EV gearing over AMP8[84]. As a result, PNN's current unlevered beta may overstate that expected over AMP8. Ofwat cites three reasons for why PNN's expected EV gearing could be higher in future: (1) the acquisition of highly geared SES; (2) an equity financing gap; and (3) the impact of enforcement action on equity value.

216. On (1), SES has a negligible impact on PNN's gearing. On (2), PNN's recent £490m right issue has closed the equity financing gap as recognised by BNP Paribas, RBC and Morgan Stanley[85]. On (3), the enforcement action did not have a statistically significant impact on PNN beta and the announcement of enforcement action did not have an impact on the differential between PNN and SVT/UUW betas. Further, Ofwat has opened enforcement cases against SVT/UUW which means this is not a difference among listed companies.

217. Separately, CEPA highlights that over a quarter of PNN's 2024 revenue comes from business retail activities[86]. The retail activities are subject to competition which likely make them riskier than wholesale activities.

[82] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 6.3.19, SOC-7-0034.
[83] KPMG, March 2025, Estimating the Cost of Capital for PR24, paras 6.2.13 and 6.4.46, SOC-7-0034.
[84] Ofwat, December 2024, PR24 final determinations - Aligning risk and return – allowed return appendix, pages 52-54, SOC-7-0005.
[85] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 6.3.39, SOC-7-0034.
[86] CEPA, December 2024, PR24 Cost of Equity, SOC-1-0021.

218. A company's beta is driven by its total return which comprises dividend and capital gain. It is more relevant to focus on operating profit rather than revenue as operating profit is more directly tied to dividends and therefore beta. PNN's retail activities contribute less than 2% of operating profit. In contrast, SVT's non-regulated activities contribute around 10% of its operating profit[87]. This suggests that PNN's beta is not affected by its retail activities and is more representative of a pure play water company than SVT's beta.

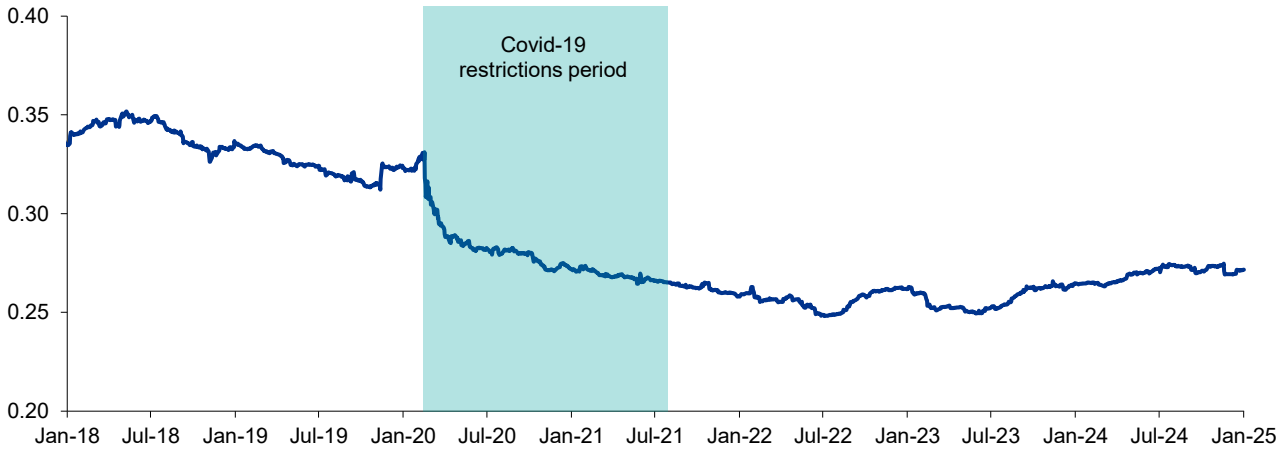
219. Ofwat includes PNN is in its market-to-asset ratio (MAR) cross-check. It is inconsistent for Ofwat to use PNN data to cross-check the notional company's allowed return but not to inform the notional company's beta. Ofwat should reflect PNN data in both the MAR and beta as it does for SVT and UUW.

Beta error 2: BAU beta – Distortive events

220. AMP7 was heavily affected by the government's response to the Covid-19 pandemic. The government imposed extensive restrictions in response to Covid-19 such as shutting down large sections of the economy. The Bank of England commented in relation to the government's restrictions: "*The prospect of economic paralysis, due to a global health crisis, pressed the UK Government to take unprecedented measures to protect the economy and millions of jobs*"[88].

221. 5Y water betas immediately and significantly declined during the period in which the government imposed Covid-19 restrictions. This is shown in the chart below. The dates for the restrictions period (16 March 2020 to 19 July 2021) have been sourced from the UK Covid-19 timeline[89].

Figure 9: Evolution of 5Y SVT/UUW unlevered betas over 2018-2024



Notes: Based on equally-weighted stock portfolios.
Source: KPMG analysis.

222. Structural break analysis supports the conclusion that water betas were significantly impacted by Covid-19 restrictions. It shows these restrictions caused a statistically significant reduction in 10Y water betas[90].

[87] KPMG, March 2025, Estimating the Cost of Capital for PR24, figure 16, SOC-7-0034.
[88] Bank of England, October 2021, The UK economy during Covid-19: insights from the Bank of England's Citizens' Panels, SOC-7-0042.
[89] Institute for Government, December 2022, Timeline of UK government coronavirus lockdowns and restrictions, SOC-7-0043.
[90] KPMG, March 2025, Estimating the Cost of Capital for PR24, paras 6.2.5-6.2.6, SOC-7-0034.

223. As the government shut down large sections of the economy during the restrictions period, a number of sectors faced high fixed costs and no revenue such as airports, hotels and restaurants. This resulted in an increase in the betas of these highly affected sectors. As the betas for highly affected sectors increased, the betas for less affected sectors, such as water, must mechanically decrease for the beta across the market to remain 1. This explains why water betas were depressed during the restrictions period.

224. The government's restrictions in response to Covid-19 had an unprecedented impact on the economy and society. It is highly unlikely that the government will respond to future pandemics by mandating such extensive restrictions again. The beta like for other CAPM parameters is meant to reflect the long investment horizon for the sector. Accordingly, excessive weight should not be attached to the restrictions period in the estimate of the beta as a period like this is highly unlikely to reoccur over a long investment horizon.

225. This approach recognises that a pandemic may reoccur over a long investment horizon but a government response to a pandemic that involves extensive restrictions would not.

226. Ofwat relies on 5Y and 10Y historical water betas to estimate the beta for AMP8.

227. The restrictions period affects more than 1Y of dates in 5Y betas. As a result, 5Y water betas are materially distorted downward and reliance on these assume a restrictions period will reoccur again in the next 5Y. 10Y betas also overlap with the restrictions period so 10Y water betas are distorted downward in the same way as 5Y water betas but to a far lesser extent (albeit the reduction to 10Y water betas caused by the restrictions period is still statistically significant).

228. Ofwat considers the impact of Covid-19 including the restrictions period on water betas is uninfluential. This is wrong because it is inconsistent with the results of structural break analysis above. As Ofwat considers the restrictions period is uninfluential, it does not adjust for this in its estimate of the beta. The result is an estimate of the beta that is materially distorted downward in error.

229. KPMG has estimated the BAU beta with only 10Y betas[91] to avoid placing excessive weight on the restrictions period. 10Y betas are significantly less affected by the restrictions period than 5Y betas.

230. KPMG's lower bound for the BAU beta is based on the 10Y beta for SVT/UUW of 0.29. Its upper bound is based on the 10Y beta for PNN but excludes 1Y of dates during which the Covid-19 restrictions were in place[92]. The upper bound is 0.36. The midpoint of the range of 0.29-0.36 is 0.32.

Beta error 3: Forward looking beta – conceptual arguments

231. The CMA[93] and Ofwat[94] recognise that the estimate of the beta should reflect forward-looking risks over the long investment horizon for the sector. This is consistent with the approach for other CAPM parameters.

232. Water companies face higher delivery risk and performance risk on a forward-looking basis:

- **Delivery risk:** The capital programme is ramping-up in terms of scale and complexity which are outside company control. This increases the risk of cost overruns and late delivery; and

[91] Spot betas using daily data as at 31 January 2025. This applies to all beta estimates.
[92] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 6.2.13, SOC-7-0034.
[93] CMA, October 2023, H7 Heathrow airport licence modification appeals, paras 6.69 and 6.87, SOC-7-0044.
[94] Ofwat, July 2024, PR24 draft determinations - Aligning risk and return – Allowed return appendix, page 49, SOC-7-0045.

- **Performance risk:** The PR24 regulatory framework imposes more stringent performance targets which increases the risk of ODI penalties.

233. Delivery risk is driven by mostly systematic factors:

- **Input prices:** Input prices depend on a range of macroeconomic factors. These macroeconomic factors are partially but not fully hedged by totex allowances which are linked to inflation and include RPEs. The unhedged macroeconomic factors can drive large differences between outturn input prices and totex allowances for companies, such as those observed recently on energy costs. A larger capital programme increases companies' exposure to the unhedged macroeconomic factors;

- **Supply chain:** The supply chain on a capital project impacts the project's cost, quality and speed of delivery. Water companies rely on a supply chain that serves the entire market, not solely water companies, to deliver their capital projects. A larger capital programme means water companies have to use the market-wide supply chain more. At the same time, other infrastructure sectors are expanding their capital programmes which reduces the size of the market-wide supply chain available to water companies. In combination, this increases the exposure of water companies to the market-wide supply chain and in turn to macroeconomic factors;

- **Financing:** Water companies must raise capital to finance the capital programme. The cost at which companies raise capital depends significantly on macroeconomic factors such as interest rates at a point in time and inflation. These macroeconomic factors are partially but not fully hedged by the cost of new debt allowance which is linked to inflation and a floating interest rate. The unhedged macroeconomic factors can drive large differences between outturn debt costs and the cost of new debt allowance for companies, which can be observed on new water bonds issued in AMP7. A larger capital programme increases companies' exposure to the unhedged macroeconomic factors;

- **Political and social:** The capital programme is largely driven by requirements that are subject to close political and social attention such as environmental obligations. The regulator may penalise companies more severely for late delivery where public perception is negative than where it is positive. Separately, the capital programme is being undertaken at a time where economic conditions are volatile and there is a sharp focus on affordability. The regulator may penalise companies more severely for cost overruns or set tougher cost allowances in an economic downturn than where economic conditions are better; and

- **Complexity:** The costs and timelines of complex capital projects are by their nature difficult to estimate ex-ante which exacerbates the risk that outturn costs and timelines differ from allowances and targets. This is driven by how complexity exacerbates the risk factors above. For example, complex capital projects have longer timelines which extends the window in which supply chain risks could crystallise.

234. S&P recently recognised a number of these points in its downgrade of Ofwat's framework: *"The whole sector will have to execute a much bigger capital program than in the past. This poses a significant execution risk to ensure the program can be delivered in due course and within the allowances... Each company will face significant pressure to secure its supply chain and financing accordingly and management to ensure the right execution of the plan in a timely fashion and within budget. Furthermore, they will face additional scrutiny from the regulator in AMP8 with the inclusion of price control deliverables, resulting in expanded oversight of delivery through increased*

reporting and the application of time-based incentives"[95].

235. Performance risk is driven by both company-specific and systematic factors. In relation to the company-specific factors, a company's performance is driven by the condition of its assets and its local geography. In relation to the systematic factors, the regulator exercises judgment within the broader political and social context when setting performance targets. This means, for example, where public perception of companies is negative, the regulator may set tougher performance targets than where public perception is positive.

236. These forward-looking risks have only become clear very recently. These risks are already in part reflected in short-term betas but not long-term betas as long-term betas only reflect new information with a long lag. KPMG has relied on long-term betas to estimate the BAU beta and so the forward-looking risks for AMP8 must be reflected via an uplift to the BAU beta.

237. The systematic components of higher delivery risk can be translated into an uplift to the BAU beta, but this is very challenging for higher performance risk. As such, even after adjusting the BAU beta, the resultant beta will not completely reflect the forward-looking risks which water companies face at AMP8.

238. Delivery risk is commonly measured based on capex, or capex relative to total assets (capital intensity). Both measures proxy the scale and complexity of a capital programme. In the case of water companies, both measures demonstrate they face higher delivery risk at AMP8 than in previous AMPs.

239. KPMG has shown empirically that delivery risk has a large systematic component using capital intensity, which corroborates the theoretical rationale for this above. In particular, it found a clear and statistically significant relationship between increases in capital intensity and beta[96]. Economic Insight has found a similar relationship which supports KPMG's finding[97].

240. Higher delivery risk can be translated into an uplift to the BAU beta using capital intensity. The required uplift to the BAU beta is set out in the sections below.

241. Importantly, Ofwat has set a beta of 0.28 at PR24 which is below the CMA's beta of 0.29 at PR19. This wrongly implies that risk for AMP8 has decreased relative to AMP7.

Forward-looking beta – National Grid data

242. Regulators have expanded their comparator set for the beta beyond their particular sector to ensure forward-looking risks for their sector are reflected in their estimate of the beta.

243. For example, Ofgem has included European networks in its beta comparator set for RIIO-3 for this purpose. Ofgem considers European networks are beneficial for this purpose as they face similar challenges to GB networks relating to meeting net zero targets. This is despite that European networks operate under different countries and regulatory regimes than GB networks. In this context, Ofgem comments that:

[95] S&P, February 2025, U.K. Water Regulatory Framework Support, Low Financial Flexibility In Coming Regulatory Period Drive Rating Actions, page 13, SOC-1-0013.
[96] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 6.4.8, SOC-7-0034.
[97] Wessex Water, August 2024, Response to Ofwat's PR24 draft determination - Annexure 6 - EI Report on Asset Growth and Systematic Risk, SOC-7-0046.

- *"To ensure that we are capturing the risk of the sector on a forward-looking basis as accurately as possible, we have considered ways to make our beta assessment more robust… we view the best improvements are likely to focus on including other relevant comparators in our dataset"* [98]*; and*

- *"On balance, we provisionally see a net benefit in including European utility companies in our comparator set. While these companies operate in a different country and under a different regulatory regime, they are likely face similar challenges relating to meeting net zero target"* [99]*.*

244. Accordingly, it is relevant to consider whether the beta comparator set for AMP8 should be expanded beyond water companies to reflect the forward-looking risks in AMP8 associated with higher capital intensity.

245. Energy networks and water companies face similar challenges relating to the delivery of capital programmes to meet government policy. Relatedly, energy companies have had higher levels of capital intensity than water companies in the past (albeit this is below that water companies face in AMP8)[100]. As such, it may be beneficial to expand the beta comparator set for AMP8 to energy networks.

246. The rationale for including energy networks in the beta comparator set for AMP8 is at least as strong as Ofgem's rationale for expanding the same for RIIO-3. This is because UK water companies and GB energy networks face similar challenges as well as operate in the same country and under very similar regulatory regimes. The similarity of the regulatory regimes was recognised by the CMA in RIIO-2 and Ofgem in RIIO-3[101].

247. As water companies and energy networks operate in the same country and under similar regulatory regimes, the difference in historical energy and water betas is largely driven by the higher capital intensity for energy networks. In consequence, the inclusion of energy networks represents the most straightforward way of reflecting the forward-looking risks for AMP8 associated with higher capital intensity.

248. Ofgem has historically focused on data from National Grid to estimate the beta for energy networks. For this reason, National Grid is the only energy network that KPMG has included as an additional comparator.

249. The 10Y beta for National Grid excluding the Covid-19 restrictions period is 0.33.

Forward looking beta – additional approaches

250. KPMG and Economic Insight have developed additional approaches for translating the impact of higher capital intensity at AMP8 into an uplift to the BAU beta.

251. The first two approaches are based on the observed relationship between capital intensity and beta. KPMG and Economic Insight have each developed a cross-check using this relationship but in different ways. The third approach is based on converting the impact of higher capital intensity on RoRE to beta.

[98] Ofgem, July 2024, RIIO-3 Sector Specific Methodology Decision – Finance Annex, para 3.194, SOC-7-0021.
[99] Ofgem, July 2024, RIIO-3 Sector Specific Methodology Decision – Finance Annex, para 3.197, SOC-7-0021.
[100] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 6.3.30, SOC-7-0034.
[101] KPMG, March 2025, Estimating the Cost of Capital for PR24, paras 6.3.26-6.3.27, SOC-7-0034.

Relationship between capital intensity and beta – KPMG[102]

252. KPMG ranked non-financial stocks in the FTSE350 index to form decile portfolios based on their capital intensity over 2014-2024. The water sector's historical capital intensity lies in the 6th decile portfolio and forecast capital intensity for AMP8 based on Ofwat's FD lies in the 7th decile portfolio.

253. KPMG estimated the difference in historical beta between the 7th decile portfolio less 6th decile portfolio over 2014-2024. This provides an indication of the impact of higher capital intensity on water betas. For reference, the decile portfolios are well-diversified and therefore the difference in beta between decile portfolios are driven by systematic risks associated with capital intensity, rather than company-specific risks.

254. The difference in historical beta is statistically significant and positive; specifically, the difference is 0.04-0.15. KPMG adopted the lower end of this range to reflect that most companies in the FTSE350 index do not benefit from regulatory protections. Applying the lower bound of 0.04 as an uplift to the midpoint of the BAU beta range (0.32) results in a forward-looking beta of 0.37.

255. The benefits of this approach are:

- It isolates systematic risks associated with capital intensity from other drivers of risk;
- Evidence can be drawn from the wider market and not only comparators that have a similar risk profile to the water sector in every respect other than on capital intensity; and
- It is fully consistent with using the CAPM to set the cost of equity.

Relationship between capital intensity and beta – Economic Insight[103]

256. Economic Insight used fundamental beta analysis to relate beta to underlying drivers of systematic risk. Specifically, it regressed betas for non-financial stocks in the FTSE100/350 against measures for a range of systematic risk factors, including asset growth, over 2013-2022. This regression separately identifies the impact of each systematic risk factor on beta. For reference, asset growth is different to capital intensity but both measures capture the delivery risk associated with larger capital programmes.

257. Economic Insight found a clear and statistically significant relationship between increases in asset growth and beta. In particular, a 1 percentage point increase in asset growth is associated with an increase in beta of close to 0.01. The water sector's historical asset growth is 2% and forecast asset growth for AMP8 is 4.2-5.8%. The difference in asset growth of 2.2-3.8% implies an increase to the water beta of 0.02-0.03. Applying this as an uplift to the midpoint of the BAU beta range results in a forward-looking beta of 0.34-0.36.

258. The benefits of this approach are the same as those for the approach above.

Converting the impact of higher capital intensity on RoRE to beta[104]

259. Beta can be expressed as the product of: (1) correlation between the returns of the company and the market; and (2) standard deviation of the company's return divided by the standard deviation of the market's return. It follows from this expression that any changes in the company's risk exposure are reflected in its beta through the standard deviation of its return, assuming all else equal.

[102] KPMG, March 2025, Estimating the Cost of Capital for PR24, section 6.4.II, SOC-7-0034.
[103] Wessex Water, August 2024, Response to Ofwat's PR24 draft determination - Annexure 6 - EI Report on Asset Growth and Systematic Risk, SOC-7-0046.
[104] KPMG, March 2025, Estimating the Cost of Capital for PR24, section 6.4.III, SOC-7-0034.

260. Ofwat measures a company's risk exposure using P10-P90 RoRE ranges rather than standard deviation. KPMG modelled the overall P10-P90 RoRE range forecast for the notional company at AMP8 based on Ofwat's FD. It developed a separate case where it replaced its totex P10-P90 range forecast for AMP8 with Ofwat's forecast for AMP7. This was to estimate the impact of higher capital intensity at AMP8 on the overall P10-P90 RoRE range while controlling for other drivers of risk.

261. KPMG assumes the overall P10-P90 RoRE ranges for both cases are normally distributed to calculate the standard deviation for each case. The standard deviation for the first case is 1.10x higher than that for the second case due to the impact of higher capital intensity. The expression for beta above indicates that the water beta should increase by the same assuming the risks associated with capital intensity are entirely systematic. Applying 1.10x as an uplift to the midpoint of the BAU beta range results in a forward-looking beta of 0.36.

262. The benefits of this approach are:

- It isolates the risks associated with capital intensity from other drivers of risk;
- It focuses on the notional water company and RoRE measures of risk like Ofwat; and
- It is fully consistent with using the CAPM to set the cost of equity.

263. Ofwat's advisors at PR24, CEPA, agree that "*larger capex-to-RCV ratios create a greater potential impact on financial returns from cost efficiency incentives, relative to their base return. This can be shown by changes in Return on Regulatory Equity (RoRE)*"[105].

Forward-looking beta – short-term water beta data

264. Short-term betas are less robust than long-term betas but have two key benefits:

- Short-term water betas already partially reflect forward-looking risks unlike long-term water betas; and
- Short-term water betas reflect forward-looking delivery and performance risks, whereas the approaches above reflect only the forward-looking delivery risk associated with higher capital intensity.

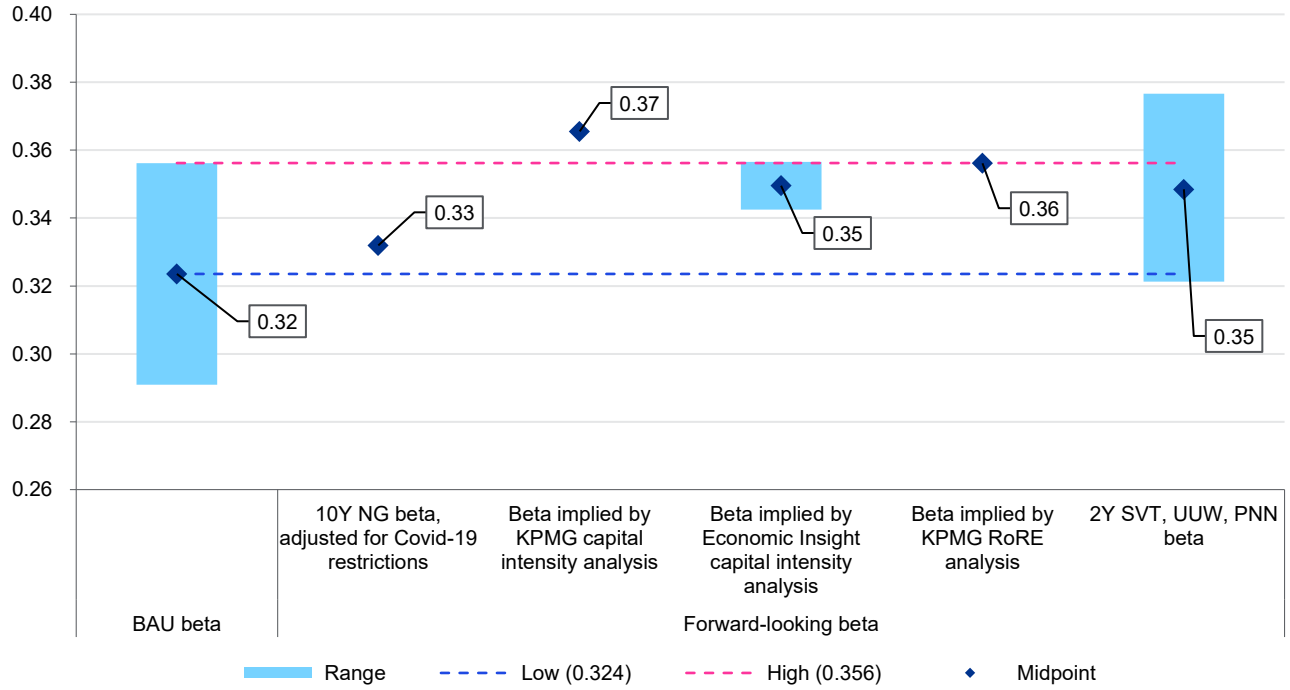
265. The forward-looking beta range is grounded in 10Y betas. For reference, the 2Y beta range for SVT, UUW and PNN is 0.32-0.38[106].

Beta range

266. The beta range is presented in the chart below. The BAU beta range is 0.29-0.36. The forward-looking beta evidence indicates the BAU beta range should be attenuated to reflect only the upper half to estimate the beta for AMP8. The lines in the chart represent the attenuated range of 0.32-0.36.

[105] CEPA, July 2024, PR24 Cost of Equity, page 78, SOC-7-0047.
[106] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 6.4.46, SOC-7-0034.

Figure 10: BAU and forward-looking beta ranges



Source: Southern Water analysis based on KPMG and Economic Insight reports[107].

267. The attenuated unlevered beta range is converted into an asset beta range in the table. This conversion adopts Ofwat's debt beta of 0.10. This results in an asset beta range for the industry of 0.37-0.41.

Table 2: Overall beta range

	Lower bound	Upper bound
Unlevered beta	0.32	0.36
Debt beta	0.10	0.10
Observed gearing	51.19%	50.18%
Asset beta	0.37	0.41

Source: Southern Water analysis based on KPMG report.

Proposed remedy

268. Ofwat has erred in estimating its beta range as it has not included PNN data, adjusted for distortive events or reflected the expected increase in risk for AMP8. KPMG has undertaken analysis that corrects these errors. KPMG' asset beta range for the industry is 0.37-0.41.

269. We have demonstrated that we have the largest and most complex capital programme for AMP8 across the sector due to the specific characteristics of our local region[108]. This means we have

[107] Southern Water, March 2025, WACC Data book, worksheet "C_Figure 10", SOC-7-0001.
[108] See section 2.3.

higher exposure to systematic risk than other companies due to factors outside of our control. Accordingly, we have selected the upper end of KPMG's industry range of 0.41 as our point estimate for the asset beta. We request that the CMA redetermines the asset beta in line with our point estimate.

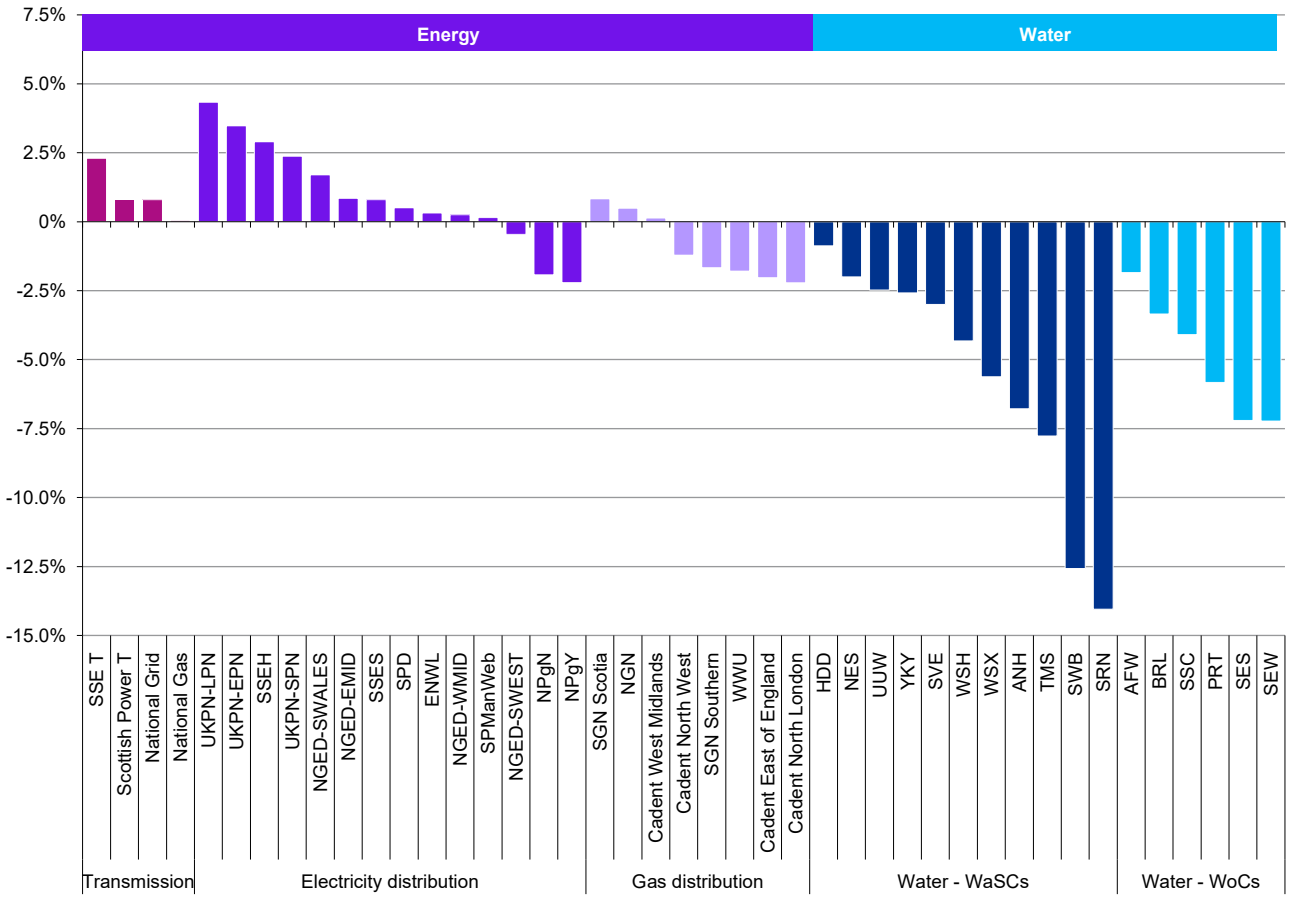
270. Our point estimate for the asset beta is slightly above the Ofgem's RIIO-3 range of 0.35-0.4. This reflects that water is clearly riskier than energy, in particular:

- 2Y betas for SVT, UUW and PNN are higher than 2Y, 5Y and 10Y betas for National Grid;
- Current credit spreads in water are higher than in energy for maturity- and rating-matched bonds;
- The rating agencies have recently downgraded their rating of Ofwat's framework to one or two notches below their rating of Ofgem's framework;
- Higher operational risks for water over energy have already crystallised in part based on the chart below. The chart shows that operational performance for energy is generally positive where it is significantly negative in water based on the most recent data109; and
- Ofwat's debt beta is higher than Ofgem's (even though Ofwat assumes a lower notional gearing which would imply a lower debt beta). This means that an asset beta above 0.4 is consistent with Ofgem.

271. Barclays continues to adopt a 0.40 asset beta for the water sector as a whole post-FD[110]. It noted at DD that *"Ofwat sees water as a lower-risk asset than other regulated assets. We do not see evidence of this, nor do investors... for example, we now see an asset beta for water of 0.40 versus 0.37*[111] *for power"*[112]. We have higher exposure to systematic risk than the wider sector which supports our asset beta of 0.41. Our asset beta of 0.41 is slightly above Barclays' point estimate for the sector of 0.40.

[109] Every water company has a negative RoRE with a P25-P75 range of -7.2% to -2.6% and P50 of -4.3%. Energy networks have a P25-P75 range of -1.0% to +0.8% and P50 of 0.4%.
[110] Barclays, December 2024, Increasing certainty should re-rate sector, page 11, SOC-7-0048.
[111] Based on a debt beta of 0.2.
[112] Barclays, August 2024, Breaking the water cycle – no longer so positive, page 64, SOC-7-0049.

Figure 11: Operational RORE across energy and water in 2023-24



Notes: Operational RORE includes totex, ODIs and incentives. All based on actual returns with notional capital structure for each sector.
Source: Southern Water analysis of water from Table 1F, APR 2024; and gas distribution, electricity distribution and transmission from RFPR 2024[113].

3.2.5 Retail margin adjustment (RMA)

272. Ofwat has provided the allowed return for the household retail price control through a net margin applied to retail costs. Ofwat has referred to this net margin as the retail margin. In order to prevent double counting between the retail margin and appointee allowed return, it has separately deducted 6bps from the appointee allowed return. Ofwat has referred to this deduction as the RMA.

273. Ofwat had adopted a return on common equity (ROCE) approach for calculating the RMA. Specifically, the RMA is (allowed revenue from the retail margin less cost of financing fixed assets and working capital) / RCV. This is similar to the ROCE approach used by the CMA at PR19 to calculate the RMA.

274. The CMA did not include the return or cost for working capital in its calculation unlike Ofwat. This is because the evidence at the time suggested that most retail businesses had negative or low working capital[114]. Ofwat's PR24 financial models indicate that retail businesses are expected to

[113] Southern Water, March 2025, WACC Data book, worksheet "C_Figure 11", SOC-7-0001.
[114] CMA, March 2021, Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations - Final report, para 9.1142, SOC-7-0023.

have significant positive working capital throughout AMP8. As such, Ofwat's departure from the CMA's approach is justified.

275. In practice, the retail business is integrated with the wholesale business as is the case for us. The CMA at PR19[115] and Ofwat at PR24[116] recognised that this is the case for the wider sector. Further, Ofwat's PR24 financial model reflects that this is similarly the case for the notional company. This means that the retail business finances its assets (fixed and working capital) at the same long-term rates as the wholesale business.

RMA error 1: Financing structure for retail business

276. Ofwat's PR24 financial model indicates that (1) notional gearing is set for the appointee; and (2) the notional company raises debt up until notional gearing to support only the RCV. This means that the retail business for the notional company cannot be financed with debt as otherwise appointee gearing would increase above the notional level.

277. In consequence, the retail business must be financed with equity and therefore at the appointee cost of equity. At a minimum, the retail business should be financed at the appointee WACC although this would result in appointee gearing increasing above the notional level.

278. In this context, the main error in Ofwat's calculation relates to the financing of the retail business' working capital. Ofwat's calculation either assumes this is financed using the appointee RCF or with a separate retail debt facility. The first case is wrong because Ofwat has assumed the appointee RCF is fully available to support the wholesale business in its cost of carry allowance. The second case is wrong because the financing of the retail business is fully integrated with the wholesale business as highlighted above.

279. KPMG has amended Ofwat's calculation of the RMA to reflect two scenarios for the cost of financing fixed assets and working capital for the retail business. In particular, KPMG has used its estimate of (1) the appointee cost of equity; and (2) the appointee WACC. The RMA in the first scenario is -0.03% and in the second scenario is 0.01%[117]. This is significantly smaller than Ofwat's 0.06%.

RMA error 2: DPC and SIPR assets

280. Ofwat's calculation includes the revenue on DPC and SIPR assets but excludes the cost of financing these fixed assets. If revenue *and* costs for DPC and SIPR assets were reflected in Ofwat's calculation, this would further reduce the RMA of 0.01% above. The resultant RMA is likely to be close to nil and could represent spurious accuracy in line with the CMA's view at PR19[118].

Proposed remedy

281. Ofwat has erred in estimating the RMA for the reasons outlined above. KPMG has amended Ofwat's calculation of the RMA to correct these errors and estimates an RMA of nil. We request that the CMA redetermines the RMA in line with KPMG's estimate.

[115] CMA, March 2021, Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations - Final report, para 9.1140, SOC-7-0023.
[116] Ofwat, December 2024, PR24 final determinations - Aligning risk and return – allowed return appendix, page 124, SOC-7-0005.
[117] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 8.1.5, SOC-7-0034.
[118] CMA, March 2021, Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations - Final report, para 9.1139, SOC-7-0023.

3.2.6 Required cost of equity before aiming up

282. The table below compares our estimate of the cost of equity to Ofwat's allowed return before aiming up. Our estimate of the cost of equity before aiming up is 6.39% whereas Ofwat's estimate is 4.83%. The RMA is not considered in this table but is captured in section 5.

283. We request that the CMA redetermines the cost of equity before aiming up in line with our estimate of 6.39%.

Table 3: Required cost of equity before aiming up (CPIH-real)

Parameter	Ofwat FD	Southern Water
Data cut-off date	**September 2024**	**January 2025**
Notional gearing	55%	60%
RFR	1.52%	2.59%
TMR	6.83%	6.93%
Asset beta	0.34	0.41
Debt beta	0.10	0.10
Notional equity beta	0.62	0.88
Cost of equity before aiming up	**4.83%**	**6.39%**

Source: Southern Water analysis based on KPMG report.

3.3 Aiming up

3.3.1 Introduction

Role of cross-checks

284. Ofwat uses the CAPM as the primary model for estimating the allowed return. The CAPM is a mainstream and easy to use model but has widely accepted limitations. This has been recognised by Ofwat, UKRN[119] and the CMA[120]. For example, Ofwat has commented that the CAPM represents a simplification of the real world[121] and its own specification of the CAPM relies on significant backward-looking data[122].

285. As the CAPM is just one model for estimating the allowed return and one with known limitations, regulators use market benchmarks to cross-check the CAPM-implied cost of equity. The role of these cross-checks is to provide (1) assurance over the CAPM-implied cost of equity; and (2) a basis for aiming up above the midpoint of the CAPM-implied range to select the point estimate for the allowed return.

286. Ofwat uses a single market benchmark to cross-check the allowed return. This is the MAR which is discussed further in section 3.3.4. We and other companies in the sector have proposed several

[119] UK Regulators Network, March 2023, Guidance for regulators on the methodology for setting the cost of capital, page 26, SOC-7-0019.
[120] CMA, October 2021, RIIO-2 Final Determination Volume 2A: Cost of equity, para 5.718, SOC-7-0051.
[121] Ofwat, December 2021, PR24 and beyond: Discussion paper on risk and return, page 20, SOC-7-0087.
[122] Ofwat, July 2022, Creating tomorrow, together: consulting on our methodology for PR24 - Appendix 11 – Allowed return on capital, page 24, SOC-7-0088.

cross-checks (some new and others well-tested) for Ofwat to consider but Ofwat has rejected all these proposals in error.

287. KPMG has responded to the points raised by Ofwat in rejecting these proposals, and demonstrated that Ofwat's view is flawed[123].

Ofwat's bar for inclusion of cross-checks

288. Ofwat has in error created an artificially high bar for the inclusion of new cross-checks. In particular, it has assessed the cross-checks proposed by companies (1) based on different criteria for each cross-check; and (2) as if they were intended to replace the CAPM as the primary model for setting the allowed return, rather than functioning as a cross-check.

289. Ofwat has not appraised the MAR against any criteria. This suggests that it has a significantly lower bar for inclusion of its own cross-checks relative to those proposed by companies. If Ofwat were to assess the MAR and even the CAPM under the criteria which it applied to companies' proposed cross-checks, these would both fail.

290. The CMA at PR19 did not rely on the MAR: *"we remain cautious about using market prices to determine the point estimate for the cost of equity or overall cost of capital"*[124] and *"…we have therefore not given the MAR analysis significant weight in coming to a final view on the point estimate"*[125].

291. This is mainly because the MAR is driven by many factors besides the cost of equity and the MAR-implied cost of equity is highly sensitive to the assumptions used for these other factors. This makes it very challenging, if not impossible, to draw robust inferences about the cost of equity from the MAR. KPMG and Frontier Economics have criticised the MAR in PR24 and RIIO-3 respectively.

292. All the cross-checks proposed by companies are superior to the MAR. This is clear based on an assessment of these cross-checks against a common and more robust set of criteria than used by Ofwat[126]. One of the cross-checks we proposed (multifactor models[127]) has been empirically proven to outperform the CAPM. This cross-check has met a bar far higher than any cross-check should need to but has still been rejected by Ofwat.

293. Ofwat has relied on a narrow range of cross-check evidence i.e. only the MAR. In contrast, Ofgem used a suite of cross-checks at RIIO-2 because it considered it can take more confidence from and rely more heavily on cross-checks where a wide suite is applied. We have proposed a wider suite of cross-checks than Ofgem. This includes the MAR in addition to our cross-checks.

294. The consequence of Ofwat creating an artificially high bar for the inclusion of new cross-checks is that it omitted valuable evidence for setting the allowed return. This increases the risk that the allowed return has been miscalibrated and accordingly does not reflect the required return.

[123] KPMG, March 2025, Estimating the Cost of Capital for PR24, section 9, SOC-7-0034.
[124] CMA, March 2021, Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations - Final report, para 9.1358, SOC-7-0023.
[125] CMA, March 2021, Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations - Final report, para 9.1362, SOC-7-0023.
[126] KPMG, August 2024, Estimating the Cost of Equity for PR24, table 33, SOC-7-0050.
[127] See the multifactor model analysis in section 3.3.5.

Role of aiming up

295. The role of aiming up above the midpoint of the CAPM-implied range is to promote investment.

296. This is particularly important for AMP8. The water sector has to raise record levels of new equity capital at a time where investor sentiment towards the sector is negative and there is intense competition for capital. For the allowed return to attract investment, aiming up must address the higher quantity of risk and higher price of infrastructure capital in AMP8 relative to previous AMPs as highlighted in section 2.2.2.

297. Ofwat recognised the importance of aiming up for promoting investment: *"It is important that our determinations are seen to support investment and investor confidence at a time when all companies (whether good or poor performers) are expected to continue to raise record levels of debt and equity finance, while competing with other sectors and internationally for the allocation of that capital"*[128].

298. The CMA at PR19 aimed up for more factors than solely to promote investment:

- Promoting investment;
- Scale of parameter uncertainty in estimating the cost of equity;
- The need for the cost of equity to be sufficiently high to support debt financeability; and
- Asymmetry of risk in the price control package.

299. We consider that the other factors that the CMA cites are critical to promoting investment. For example, an investor would not commit new equity where they face downside asymmetric risk in returns. It follows that the CMA's ultimate role for aiming up is to promote investment. The CMA's statements at RIIO-2 made this clear: *"…the ultimate requirement should be to ensure that the overall cost of equity allowance is sufficient to attract investors and allow companies to finance their activities"*[129].

300. We have aimed up for the following factors which build on the CMA's rationale at PR19:

- **Risk-reflective vs other asset classes:** The equity risk premium in the allowed return on equity should reflect the higher risk of water equity than water debt. If the equity risk premium is not risk-reflective, there is no incentive for investors to invest in water equity over water debt;
- **Risk-reflective vs other sectors:** The allowed return on water equity should be competitive relative to the equity return available in other sectors of comparable risk. If the allowed return is not risk-reflective, there is no incentive for investors to invest in water equity over equity in other sectors of comparable risk;
- **Market evidence:** The required return on equity can be estimated from market evidence. This provides an additional data point for ensuring the allowed return is consistent with the required return of investors;

[128] Ofwat, December 2024, PR24 final determinations - Aligning risk and return – allowed return appendix, page 84, SOC-7-0005.
[129] CMA, October 2021, RIIO-2 Final Determination Volume 2A: Cost of equity, para 5.723, SOC-7-0051.

- **Parameter-level cross-checks:** There is uncertainty in the estimates of the parameters for the cost of equity as the cost of equity is unobservable. The estimates of the parameters should be cross-checked to reduce the uncertainty that the allowed return is different to the required return of investors;

- **Debt financeability:** The allowed return plays a role in ensuring that companies are debt financeable. If the allowed return is not debt financeable, companies will not be able to meet their licence conditions; and

- **Fair bet:** Investors should be able to achieve the allowed return at the mean RoRE position and have equal likelihood for upside and downside around the mean RoRE position. This is referred to as a fair bet. Investors will not commit new equity where they do not face a fair bet.

301. These factors can be exactly mapped to those used by the CMA. The first three map to promoting investment and the last three in turn map to parameter uncertainty, debt financeability and asymmetric risk. As noted above, we consider these other factors ultimately are for promoting investment.

302. We consider a range of cross-checks under each factor which are set out in the sections below. All of these cross-checks besides the MAR have in error been rejected by Ofwat as explained above.

303. For reference, some of the cross-checks we consider require an assumption for notional gearing. These cross-checks have been calibrated based on our preferred notional gearing of 60%. The cross-checks this affects are equity analyst estimates, MAR, multifactor models, debt financeability, and fair bet.

Ofwat's aiming up

304. Ofwat aimed up by 27bps in its CAPM-implied range to select the point estimate for the allowed return. Ofwat intended its aiming up to support investment but instead it served only to partially offset the downward bias in its estimation of the parameters in the cost of equity[130]. Hence, in reality, Ofwat has not achieved its objective for aiming up. Instead, it in error used aiming up as a substitute for the robust estimation of parameters.

305. The CMA at PR19 aimed up by 25bps which is slightly less than Ofwat at PR24. However, the CMA had robustly estimated each of the parameters in the cost of equity. This meant that the CMA's aiming up was solely to support investment which is not the case for Ofwat's aiming up.

306. We expect a higher aiming up is needed for AMP8. This is to enable the record level of investment in AMP8 and rebuild investor confidence to support sustainable investment in future AMPs. We consider the level of aiming up that is needed for AMP8 in the sections below.

[130] See the downward bias analysis in section 3.3.5

3.3.2 Risk-reflective vs other asset classes

Return on investment grade bonds

307. Investors have a wide range of investment opportunities that they can choose to put their capital behind.

308. Fixed income opportunities are at present offering historically high returns for low/no risk as interest rates have increased significantly. Examples of such opportunities are set out in the table below.

Table 4: Returns available from low/no risk debt over January 2025 (nominal)

Instrument	Return
UK nominal gilts[131]	5.22%
Investment grade corporate bonds[132]	6.23%
Baa1 water bonds[133]	6.19%
Yorkshire Water bond[134]	6.60%

Source: Southern Water analysis based on BoE and LSEG data.

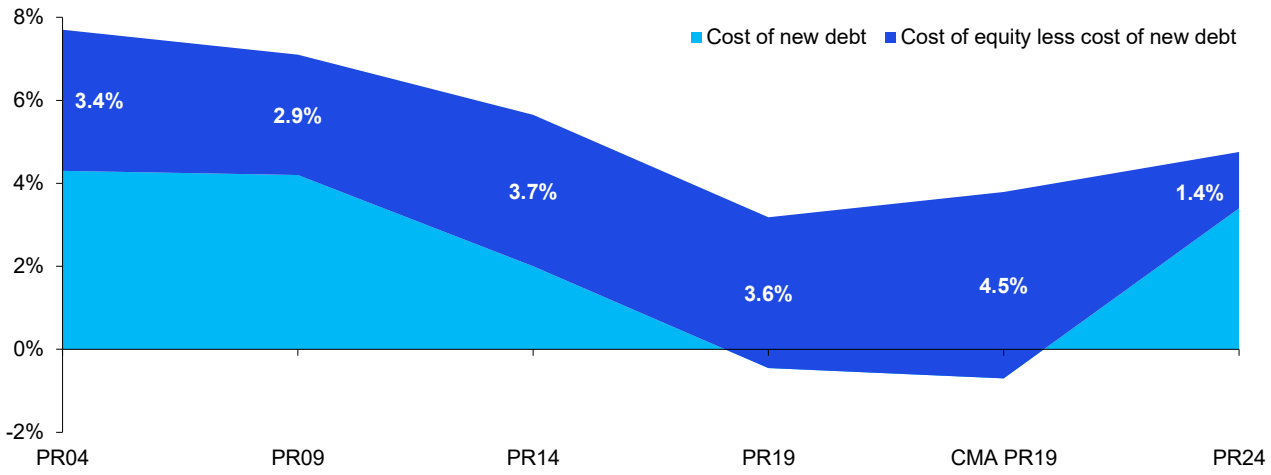
309. Water company equity is a significantly more risky investment opportunity than low/no risk fixed income. In order to persuade investors to provide new equity to water companies, Ofwat's allowed return must appropriately remunerate the additional equity risk that investors would need to take on.

310. Ofwat's allowed return is 7.20% in nominal terms[135]. This provides only a small equity risk premium over low/no risk fixed income opportunities. In particular, YKY recently issued an investment grade bond with a yield at issue of 6.60% and secondary yields on Baa1 water bonds have been 6.19%.

311. Further, Ofwat's equity risk premium for AMP8 is smaller than it allowed for previous AMPs. Specifically, the spread between Ofwat's allowances for equity and new debt is at its lowest level since at least PR04[136]. This is shown in the chart below. Importantly, the allowance for new debt is based on investment grade bonds.

[131] Based on 20Y UK nominal gilt.
[132] Based on iBoxx BBB 10Y+.
[133] Based on secondary market yields for the median water company with Baa1 (Moody's only) bonds in iBoxx BBB 10Y+.
[134] Based on yield at issue on YKY's £100m fixed-rate 2035 bond issued on 24/01/2025.
[135] Ofwat's allowed return is 5.10% in CPIH terms. This is inflated using long-term CPIH inflation of 2%.
[136] In PR04, Ofwat set a single cost of debt allowance rather than splitting this between new and embedded debt. The single cost of debt allowance has been used in the chart. In PR09, Ofwat set a range for the cost of new debt of 4.1-4.3% (RPI-real). The midpoint of this range has been used in the chart.

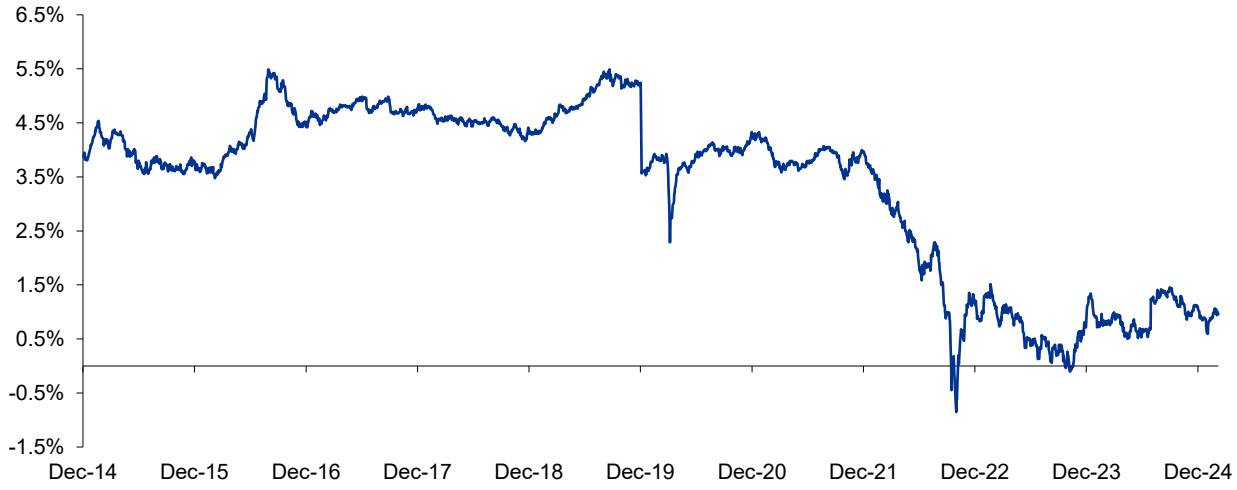
Figure 12: Allowances for cost of equity vs cost of new debt over PR04-PR24 (RPI-real)



Notes: Ofwat's 20Y RPI-CPIH wedge of 33bps is used to convert PR24 FD allowances from CPIH to RPI.
Source: Southern Water analysis based on Ofwat and CMA FDs[137].

312. This finding is corroborated by the chart below. This chart shows the equity risk premium between Ofwat's allowed return and the yield on iBoxx A/BBB 10Y+ as proxy for current borrowing costs. The maturity of the iBoxx A/BBB 10Y+ is c.20Y which matches the investment horizon for the allowed return on equity. The equity risk premium has narrowed significantly since 2022.

Figure 13: Allowed return on equity vs iBoxx A/BBB 10Y+ yields over 2015-2024 (RPI-real)



Notes: Ofwat's 20Y inflation assumptions over PR14-PR24 are used to calculate the RPI differential.
Source: KPMG analysis.

313. Ofwat has not justified why a smaller equity risk premium is appropriate for AMP8. In stark contrast, Ofwat should have allowed a larger equity risk premium for AMP8 compared to previous AMPs because:

- **Interest rates are rising:** This increases debt returns without a change in risk. Equity returns will need to increase by more than debt returns to maintain sufficiently strong incentives to invest in equity;

[137] Southern Water, March 2025, WACC Data book worksheet "C_Figure 12", SOC-7-0001.

- **Delivery and performance risks are rising:** These affect returns to equity more than debt. The spread between equity and debt returns will need to increase to account for these higher risks to equity; and

- **Companies all have to compete for significant new equity for the first time since privatisation:** The equity risk premium will need to increase to incentivise new, rather than just retain existing, equity investment.

314. These desktop comparisons do not require any complex analysis or reasoning. They plainly demonstrate that investors have a low incentive to invest in water company equity given the level of equity risk premium.

315. Hence, Ofwat has in error set the allowed return with an equity risk premium that is not risk-reflective based on spreads between the allowed return and low risk debt returns.

316. This cross-check can identify an error in the allowed return but cannot identify where the risk-reflective level for the cost of equity lies. The two cross-checks below, inference analysis and hybrid bonds, are designed to identify the risk-reflective level for the cost of equity based on debt pricing.

Inference analysis

317. Inference analysis is an asset pricing model that estimates the cost of equity for a stock based on the relationship between the stock's cost of equity and its cost of debt. In particular, the model estimates the stock's equity risk premium as the product of (1) the current market-wide debt risk premium; and (2) the historical ratio of the stock's equity return to its debt return.

318. Inference analysis is a different type of asset pricing model to the CAPM and MFMs. Inference analysis is based on a relative pricing approach i.e. it infers the cost of equity from the cost of debt. In contrast, the CAPM and MFMs are based on an absolute pricing approach i.e. they estimate the cost of equity using systematic risk factors. Both types of asset pricing model are valid as per Cochrane (2009).

319. For reference, Cochrane (2005)[138] explains that a relative pricing approach aims to *"learn about an asset's value given the prices of some other assets"*. In absolute pricing, an asset is priced *by "reference to its exposure to fundamental sources of macroeconomics risks"*.

320. Inference analysis is grounded in Merton (1974)[139] and Campello, Chen and Zhang (2008)[140]. Merton (1974) finds that debt and equity are both claims over a firm's assets and therefore the values of debt and equity are intrinsically related to the value of the firm's assets. Campello et al. (2008) developed a model that estimates the cost of equity based on the interrelationship between equity and debt from Merton (1974). Inference analysis is the name that has been given to the model developed by Campello et al. (2008).

321. Inference analysis has not been considered by UK regulators in previous price reviews. However, it is a valuable cross-check for the CAPM because:

[138] Cochrane, 2005, Asset Pricing - Revised edition, SOC-7-0052.
[139] R. Merton, November 1973, On the pricing of corporate debt: the risk structure of interest rates, SOC-7-0053.
[140] M. Campbello et al. , May 2005, Expected returns, yield spreads, and asset pricing tests, SOC-7-0054.

- It is an asset pricing model but based on a different pricing approach to the CAPM. In consequence, it is outside the CAPM framework and can offer a new perspective of where the allowed return should be set;
- It is based on the well-established principle that equity faces higher risks and so should earn higher returns than debt. In academic literature, this has been recognised recently by Damodaran (2023)[141] and in a regulatory context, by the CMA in its PR19 Redetermination and UKRN in its cost of capital guidance;
- The differential between the cost of equity and the cost of debt moves over time due to a variety of factors. This means it is challenging to determine what the appropriate differential should be at a given point in time. Inference analysis removes the need for such judgment; and
- It uses forward-looking data as it relies on the cost of debt which reflects market expectations over the contracted term of the debt. In contrast, Ofwat's CAPM, particularly on TMR, uses very backward-looking data which may not accurately reflect future conditions.

322. KPMG has analysed the cost of equity implied by inference analysis using a data cut-off date of January 2025. It has developed a range for this on the basis of different averaging windows between 1-12m. The results of KPMG's analysis show an inferred cost of equity of 6.50-6.73%[142].

323. This implies aiming up of 0.11-0.34% to our estimate of the cost of equity to ensure it is risk-reflective.

Hybrid bonds

324. Hybrid bonds are securities that combine both debt and equity characteristics.

325. In terms of their debt-like characteristics, hybrid bonds can have periodic coupon payments. In terms of their equity-like characteristics, the coupon payments on hybrid bonds can sometimes be deferred like dividend payments and hybrid bonds can be very long tenor similar to the perpetual nature of equity. Further, hybrid bonds sit between senior debt and equity in the company structure which means hybrid bonds are paid before equity but after senior debt.

326. As the yields on hybrid bonds are directly observable, it is possible to derive the cost of equity implied from these using an appropriate assumption for the percentage of equity-like characteristics of the hybrid bond. In particular, the cost of equity is equal to the sum of the (1) senior debt yield; and (2) spread of the hybrid bond over the senior debt yield divided by the percentage of equity-like characteristics. The greater the percentage of equity-like characteristics, the smaller the difference in returns between hybrid bonds and equity.

327. Utilities have issued hybrid bonds, namely, National Grid and SSE. These have the standard characteristics for hybrid bonds described above, were issued when the RIIO framework was operational and are currently traded. As a result, the cost of equity implied by hybrid bonds for utilities can be derived from these.

328. A cross-check relating to hybrid bonds has not been considered by UK regulators in previous price reviews. However, it is a valuable cross-check for the CAPM. This is because (1) it provides a clear, simple and intuitive link from prevailing capital market conditions as reflected in directly observable hybrid bond yields to the cost of equity for utilities; and (2) like inference analysis, it

[141] A. Damodaran, April 2023, Equity risk premiums (ERP): determinants, estimation and implications - The 2023 edition, SOC-7-0055.
[142] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 9.3.16, SOC-7-0034.

provides an objective view of what the appropriate differential between the returns on debt and equity should be for AMP8.

329. Frontier Economics has analysed the cost of equity implied by hybrid bonds[143]. It has focused on the hybrid bonds issued by National Grid because SSE has a greater share of non-regulated activities. It ensured that the results for National Grid are applicable to water companies by showing that (1) the characteristics of National Grid and water companies are similar both qualitatively and quantitatively; and (2) a recent quote on a potential hybrid bond issuance by Severn Trent implied similar results to the analysis of National Grid.

330. Frontier Economics' analysis uses a data cut-off date of September 2024. Its analysis presents a range for the cost of equity implied by hybrid bonds of 5.8-8.4% with a point estimate of 6.6%[144]. The point estimate implies aiming up of 0.21% to our estimate of the cost of equity to ensure it is risk-reflective.

3.3.3 Risk-reflective vs other sectors

Infrastructure fund equity internal rates of return (IRRs)

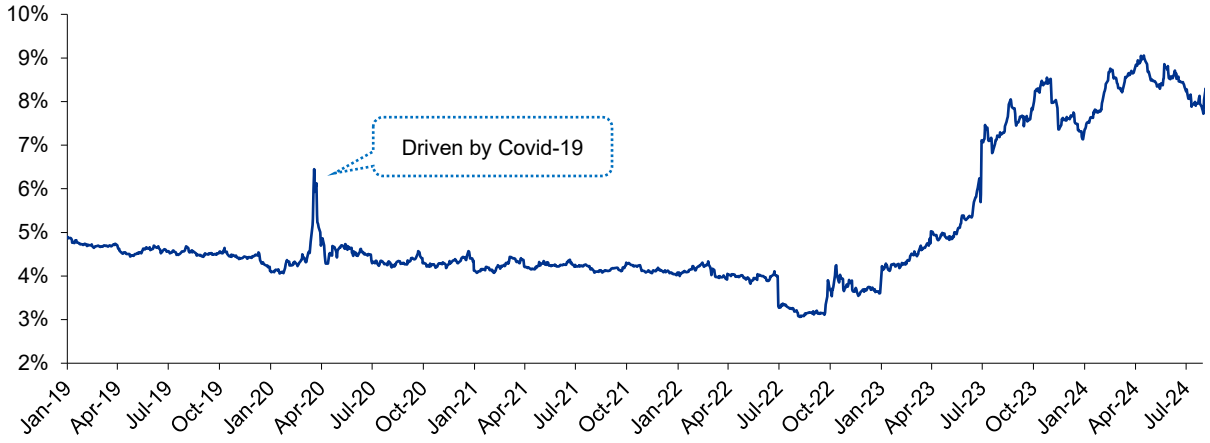
331. Ofgem at RIIO-2 cross-checked its CAPM cost of equity using equity IRRs for infrastructure funds.

332. Ofgem inferred the equity IRRs for a sample of 13 infrastructure funds that invest in private finance initiatives and private utility assets. Ofgem inferred the equity IRR for each fund by reducing the fund's equity discount rate for its premium to net asset value to account for the outperformance of the underlying assets. Ofgem took a simple average of the equity IRRs across the infrastructure funds to form the cross-check. Importantly, the cross-check assumes that infrastructure funds are of comparable risk to regulated utilities.

333. KPMG has replicated Ofgem's cross-check for PR24 and extended this to a data cut-off date of June 2024[145]. KPMG adopts this cut-off as most of the funds last reported their equity discount rates at this point. The results from KPMG's analysis for the cross-check over 2019-2024 are set out in the chart below.

[143] Frontier Economics, November 2024, Updated cost of equity cross-check evidence, section 2, SOC-7-0039.
[144] Frontier Economics, November 2024, Updated cost of equity cross-check evidence, page 20, SOC-7-0039.
[145] KPMG, March 2025, Estimating the Cost of Capital for PR24, section 9.4.II, SOC-7-0034.

Figure 14: Average infrastructure fund equity IRR over 2019-2024 (CPIH-real)



Source: KPMG analysis

334. The chart shows that the average equity IRR for infrastructure funds has increased significantly since PR19. This is because (1) the funds have reported higher equity discount rates; and (2) the share prices of the funds have declined since 2023, causing them to trade at a discount to net asset value.

335. The chart shows that the average equity IRR for infrastructure funds over June 2024 was 8.02-9.11%. As the cross-check assumes that infrastructure funds are of comparable risk to regulated utilities, the allowed return for AMP8 should be set at a comparable level according to the cross-check.

336. This implies aiming up of 1.63-2.72% to our estimate of the cost of equity to ensure it is risk-reflective.

Ofgem RIIO-3 allowed return

337. Ofgem is in the process of setting the allowed return for RIIO-3. It set its RIIO-3 SSMD in July 2024.

338. The RIIO-3 SSMD allowed return is a valuable cross-check for the PR24 cost of equity because:

- The cost of equity in both sectors is primarily based on the CAPM; and
- Ofgem uses SVT/UUW in its comparator set for the RIIO-3 SSMD beta which means that it views water companies as comparably risky to energy networks. In this respect, Ofgem comments that water companies are subject to a very similar regulatory regime as energy networks.

339. Since Ofgem set its RIIO-3 SSMD, clear market evidence has emerged that investors perceive the water sector as riskier than the energy sector. For example, Barclays comments that *"Ofwat sees water as a lower-risk asset than other regulated assets. We do not see evidence of this, nor do investors"*[146]. We have set out further market evidence that water is risker than energy in section 3.2.4.

[146] Barclays, August 2024, Breaking the water cycle – no longer so positive, page 64, SOC-7-0049.

340. As the allowed return in both sectors is set using the CAPM and water is risker than energy, the allowed return in energy is a floor for that in water. Ofgem in the RIIO-3 SSMD estimated an allowed return of 4.57-6.35% based on a data cut-off date of March 2024[147].

341. KPMG has updated the estimate to reflect a data cut-off date of January 2025. The updated estimate is 4.79-6.41%. KPMG has adopted a narrower range of 5.57-6.19% to reflect where it expects Ofgem will ultimately set the point estimate of the allowed return for RIIO-3[148].

342. Our estimate of the cost of equity is above this floor which implies it is risk-reflective.

3.3.4 Market evidence

Equity analyst estimates

343. There are a few investment banks, such as Barclays and JP Morgan, that regularly publish a house view of the required cost of equity for UK Water. These equity analyst estimates are based on the CAPM.

344. Ofwat at PR19 cross-checked its CAPM-implied cost of equity using equity analyst estimates. The CMA at PR19 placed no weight on equity analyst estimates as it considered that caution is required when interpreting these for several reasons.

345. We agree with the CMA that caution is required when interpreting equity analyst estimates. These are presented solely for the purpose of capturing the full suite of evidence.

346. Barclays estimates the required cost of equity as 6.1% and JP Morgan estimates this as 5-7%. These are based on a gearing of 55% to be comparable with the allowed return. We have converted these to be based on our preferred gearing of 60% to enable comparison with our estimate of the cost of equity[149].

347. The range for the equity analyst estimates based on a gearing of 60% is 5.16-7.41%. This implies aiming up of up to 1.02% to our estimate of the cost of equity to ensure it is in line with market evidence.

Market-to-asset ratio (MAR)

348. Ofwat has cross-checked its CAPM cost of equity using MAR analysis.

349. The MAR represents a company's ratio of its EV to its RCV. The EV of a company is the discounted value of its expected annual cashflows to investors. In theory, the RCV*Allowed WACC is the expected annual cashflow to investors given in perpetuity and the Allowed WACC is the investors' discount rate. This implies that the EV is equal to the RCV[150] and therefore the MAR is equal to 1.

[147] Ofgem presents its cost of equity based on 60% gearing.
[148] KPMG, March 2025, Estimating the Cost of Capital for PR24, footnote 220, SOC-7-0034.
[149] We assume (1) a flat WACC at 55% and 60% gearing; and (2) a cost of debt of 3.71% at 55% and 60% gearing in line with our point estimate for the sector average company.
[150] The discounted value of a constant perpetuity is given by: $PV = C / (1+r) + C / (1+r)^2 + \ldots + C / (1+r)^n$. This is equal to: $PV = C / r$. In this case, C is RCV*WACC and r is WACC; therefore the PV is the RCV.

350. In practice, the expected cashflow to investors and the investors' discount rate are generally different from the above. For example, the expected cashflow to investors could be higher than RCV*WACC if:

- The company is expected to outperform on financing, ODI and totex; and
- The company has cash-generating non-regulated businesses.

351. The investors' discount rate could be lower than the Allowed WACC if:

- The company's actual cost of debt is below the allowed level; and
- The investors' actual cost of equity is below the allowed level.

352. The EV is higher than the RCV where the expected cashflow to investors is higher than RCV*WACC or the investors' discount rate is lower than the Allowed WACC. This results in a MAR above 1.

353. The EV and in turn the MAR of a company can be observed from continuous trading for publicly listed stocks (traded MAR) and from singular transactions for privately held stocks (transaction MAR). Ofwat has focused on the traded MAR for the three listed water companies.

354. Ofwat has derived the investors' actual cost of equity implied from these MAR using assumptions to control for the other factors that affect the MAR outlined above. It considers that the MAR-implied cost of equity is widely used by investors and equity analysts and is thus a valuable cross-check for the CAPM.

355. In contrast, the CMA at PR19 placed no weight on MAR analysis. This is because it viewed MAR analysis as highly judgemental given the sensitivity of the MAR-implied cost of equity to the assumptions in the analysis.

356. MAR analysis is presented solely for the purpose of capturing the full suite of evidence. Given the CMA's valid dismissal of this analysis at PR19, it is not sufficiently robust to be relied upon.

357. KPMG has updated Ofwat's MAR analysis to a data cut-off date of January 2025[151] and to reflect our preferred notional gearing of 60%. This shows a MAR-implied cost of equity of 3.89-7.79%.

358. Ofwat's MAR analysis is based on all three listed water companies. Our estimate of the cost of equity sits within the range, albeit towards the upper end, of the updated MAR-implied cost of equity for PNN (5.79-7.79%). PNN is a closer proxy for the notional company than SVT/UUW as explained in section 3.2.4. This suggests that our estimate for the cost of equity sits within the range of that for the notional company.

3.3.5 Parameter-level cross-checks

Downward bias analysis

359. As the cost of equity is not observable, there is inherent uncertainty in the estimates of the parameters for the cost of equity. Whilst this uncertainty in the estimates of the parameters cannot be eliminated, it is important to estimate the allowed return in a way that minimises bias.

[151] KPMG, March 2025, Estimating the Cost of Capital for PR24, section 9.5.I and footnote 227, SOC-7-0034.

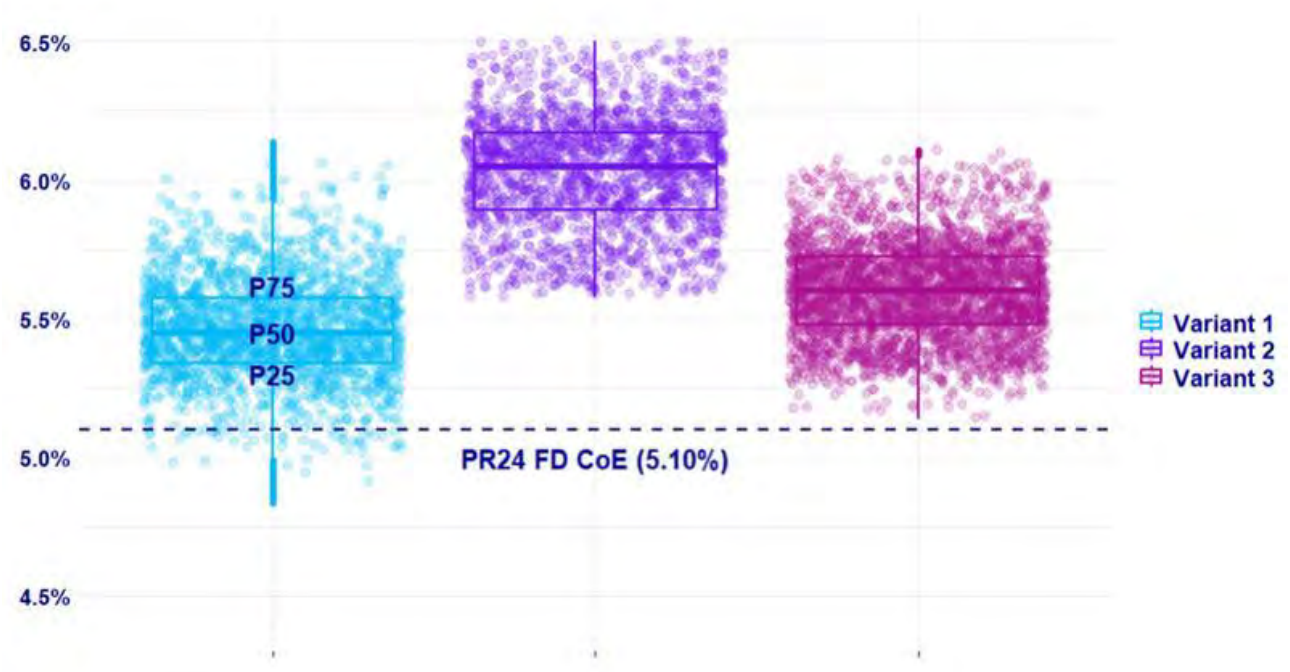
360. Downward bias could mean the allowed return is not sufficient to attract new equity at a time where companies need to raise significant new equity. Upward bias would not serve the best interest of customers.

361. KPMG has evaluated whether the allowed return reflects a balanced or biased assessment of the evidence that was submitted during the PR24 process[152]. KPMG has considered three variants for the cost of equity; each variant captures a range of plausible scenarios based on the specification of the variant[153]:

- Variant 1 reflects a wide range of potential approaches such as those considered in regulatory precedent and academic literature;
- Variant 2 starts with Variant 1 but removes approaches that contain technical flaws, rely heavily on assumptions, lack clear interpretation or have weaker support in academic literature; and
- Variant 3 starts with Variant 2 but reinstates approaches used by Ofwat that were removed in Variant 2.

362. The chart below compares the allowed return to the modelled distribution for the cost of equity under each of the three variants. The modelled distributions for the cost of equity are based on a data cut-off date of September 2024 in line with that used in the FD. This chart includes the impact of aiming up.

Figure 15: Ofwat's allowed return after aiming up vs modelled cost of equity distributions (CPIH-real)



Source: KPMG analysis

[152] KPMG, March 2025, Assessing the balance of evidence in PR24 FD CoE estimates, SOC-7-0056.
[153] KPMG, March 2025, Assessing the balance of evidence in PR24 FD CoE estimates, para 9, SOC-7-0056.

363. There are three important observations from the chart:

- The allowed return is below the median (P50) of all three variants;
- The allowed return is higher up the distribution of Variant 1 than Variant 2; and
- The allowed return is still towards the lower end of the distribution of Variant 3.

364. The first observation shows the allowed return is clearly downward biased. The second observation shows the allowed return is more downward biased when compared to only the most robust approaches for estimating the cost of equity. The third observation shows the allowed return is still downward biased when compared to the most robust approaches in addition to its own for estimating the cost of equity.

365. The consequence of these observations is that the allowed return is likely to be too low to attract new equity based on a balanced assessment of the evidence. Further, Ofwat's aiming up of 27bps does not result in an allowed return that supports investment; rather it only partially offsets Ofwat's downward bias.

Beta - multifactor models (MFMs)

366. MFMs like the CAPM are standard asset pricing models.

367. Both the CAPM and MFMs start with observed stock returns, but the CAPM uses a single risk factor (market factor) to explain these returns whereas MFMs use multiple risk factors.

368. MFMs are in effect an extension of the CAPM. Specifically, MFMs augment the single market factor in the CAPM with a series of additional risk factors. These additional risk factors like the market factor are systematic in nature for which investors demand compensation.

369. Importantly, MFMs can estimate stock returns that are higher or lower than the CAPM as a stock may have positive or negative exposure (beta) to the additional factors in MFMs i.e. MFMs are balanced.

370. MFMs have superior power than the CAPM for explaining observed stock returns. This is because MFMs more completely capture a stock's systematic risk than the CAPM by virtue of their additional factors. This has been proven for the US stock market based on a large body of academic literature[154].

371. MFMs are widely adopted by academics and practitioners for explaining observed stock returns. A recent study showed that the use of MFMs has substantially increased over the last 20 years; 69% of large US firms now use MFMs to determine their cost of equity[155]. MFMs have also been used by US regulators, for example, the Federal Reserve Bank of New York estimates the cost of equity for banks with MFMs[156].

[154] For example: K. Hou et al. , September 2014, Digesting Anomalies: An Investment Approach, SOC-7-0017 and E. Fama et al. , September 2014, A Five-Factor Asset Pricing Model, SOC-7-0008.
[155] J. Graham, March 2022, Presidential Address: Corporate Finance and Reality, table III, SOC-7-0057.
[156] A. Kovner et al. , July 2020, Evaluating Regulatory Reform: Banks' Cost of Capital and Lending, page 29, SOC-7-0058.

372. MFMs have not yet been used extensively by UK regulators to inform the allowed return. However, UK regulators have in the past recognised the value of MFMs for this purpose:

- CMA NATS RP3 FD – *"Our understanding is that multi-factor models have been rejected for use by regulators not because they are wrong – academic evidence suggests they are better in explaining actual returns to investors. They have been rejected because they are hard to populate in practice"* [157]; and
- Wright et al. (2018) for UKRN – *"Similarities between stocks with stocks with certain types of characteristics mean that multifactor models inevitably are able to explain greater proportion of the cross–section of realised returns better than CAPM can"* [158] and *"…multifactor models can provide a helpful cross-check on standard techniques for estimating CAPM betas"* [159].

373. For this reason, KPMG has analysed the MFMs-implied cost of equity for the water sector to cross-check the CAPM-implied estimate for AMP8[160]. This analysis relies on Tharyan, Gregory and Chen (2025)[161].

374. Tharyan et al. (2025) calibrated the two leading MFMs, namely, the q-factor model and the Fama French five-factor model for the UK stock market. The paper finds that both models empirically outperform the CAPM but the q-factor model has stronger performance among the two.

375. Tharyan et al. (2025) resolved the point raised by the CMA at RP3 that MFMs are hard to populate. This is because the data required to use the MFMs in the paper was made publicly available.

376. As the q-factor model was found in Tharyan et al. (2025) to be stronger, KPMG has adopted this model to perform its CAPM cross-check[162].

377. KPMG has analysed the cost of equity for water stock portfolios based on the q-factor model and the CAPM. Both models have been calibrated using a data cut-off date of December 2024, daily returns data, and our estimates for RFR and TMR. This means that the q-factor model is effectively a cross-check for the beta in the CAPM. For this reason, KPMG has calibrated the q-factor model on the same basis as our BAU beta range, such as, by using a 10Y regression window[163].

378. The differentials between the q-factor model and CAPM estimates of the cost of equity for the water stock portfolios are set out in the table below. The first stock portfolio reflects the lower bound and the second stock portfolio reflects the upper bound of the BAU beta range.

Table 5: Differentials between the cost of equity implied by q-factor model and CAPM (CPIH-real)

Water stock portfolio	q-factor	CAPM	Differential
SVT/UUW, not adjusted for Covid-19	6.07%	5.58%	0.49%
PNN, adjusted for Covid-19 restrictions	8.29%	6.26%	2.03%

Notes: (1) Based on a 10Y regression window; (2) Differential = q-factor less CAPM
Source: KPMG analysis

[157] CMA, December 2020, NATS RP3 Final Determination - Appendices and glossary, para 26, SOC-7-0059.
[158] S. Wright et al. , June 2018, Estimating the cost of capital for implementation of price controls by UK Regulators, page B-99, SOC-7-0060.
[159] S. Wright et al. , June 2018, Estimating the cost of capital for implementation of price controls by UK Regulators, page G-151, SOC-7-0060.
[160] KPMG, March 2025, Estimating the Cost of Capital for PR24, section 9.2, SOC-7-0034.
[161] R. Tharyan, January 2025, An Investigation of Multi-factor Asset Pricing Models in the UK, SOC-7-0061..
[162] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 10.1.16, SOC-7-0034.
[163] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 9.2.11, SOC-7-0034.

379. The table shows that the CAPM cost of equity is 0.49-2.03% below that implied by the q-factor model. As the q-factor model has superior explanatory power than the CAPM, this means that the CAPM understates the level of systematic risk priced in observed returns for water stocks by investors.

380. It follows that our estimate of the cost of equity underprices the systematic risk for water stocks as it is based on the CAPM. The q-factor model implies aiming-up of 0.49-2.03% to our estimate of the cost of equity.

TMR - dividend discount model (DDM)

381. The DDM expresses the current value of a stock as the present value of its expected cashflows to equity investors. In the Bank of England's (BoE) DDM, the current value of a stock is equal to its expected dividends and share buybacks discounted at its expected equity return[164].

382. The BoE's DDM can be used to estimate the expected equity return of a stock as this cannot be observed directly. In practice, the BoE applies its DDM to the broad market index rather than individual stocks which allows it to estimate the expected equity return of the market i.e. the expected TMR[165].

383. For context, the BoE's DDM assumes that dividends and share buybacks grow at the same rate. For the initial years, it assumes these grow in line with dividend expectations from equity analysts. After the initial years, it assumes these grow in line with long-term GDP forecasts.

384. The expected TMR from the BoE's DDM is a useful cross-check for the TMR in Ofwat's CAPM as the former provides a forward-looking view whereas the latter is based on very backward-looking data. Further, Ofwat, Ofgem and the CAA have used DDMs in the past to inform their estimates of the TMR[166].

385. KPMG has constructed a modified version of the BoE's DDM[167]. Its modification is to use long-term historic dividend growth from the DMS dataset in place of long-term GDP forecasts based on the CMA's view at PR19. The results from KPMG's DDM for the expected TMR over 2019-2023 are set out in the table below.

Table 6: DDM-implied TMR over 2019-2023 (CPIH-real)

	2019	2020	2021	2022	2023
DDM-implied TMR	8.87%	8.04%	6.71%	8.47%	10.02%

Source: KPMG analysis

386. The table shows that the expected TMR for 2023 has increased by 1.15% since 2019 which is when the allowed return for AMP7 was set[168]. Our estimate of the TMR for AMP8 is broadly the same as that the CMA set for AMP7. This suggests that our estimate of the TMR is conservative which supports the case for aiming up.

[164] Bank of England, 2017, Quarterly Bulletin, 2017 Q2, Topical article :An improved model for understanding equity prices, SOC-7-0062.
[165] Bank of England extracts the equity risk premium (ERP) from the TMR using TMR = RFR + ERP.
[166] Ofgem, December 2018, RIIO-2 Sector Specific Methodology Annex: Finance, para 3.72, SOC-7-0063.
[167] KPMG, August 2024, Estimating the Cost of Equity for PR24, table 42, SOC-7-0050.
[168] The CMA's TMR at PR19 was based on DMS 2020 which included data up to 2019.

TMR - survey evidence

387. Ofgem at RIIO-2 cross-checked its TMR using the expected TMR published by investment managers. KPMG has performed a version of this cross-check using survey evidence from Fernandez et al[169].

388. Fernandez et al. conducts an annual survey of finance and economics professors, analysts, and company managers on the risk-free rate and equity risk premium. In particular, the survey asks about the risk-free rate and equity risk premium used *"to calculate the required return to equity in different countries"*[170].

389. The survey results can be used to derive the required TMR for the UK. Specifically, the required TMR is the sum of the required risk-free rate and equity risk premium from the survey results for the UK. The required TMR derived from the survey results over 2019-2024 per KPMG's analysis is set out in the table below.

Table 7: Survey evidence-implied TMR over 2019-2024 (CPIH-real)

	2019	2020	2021	2022	2023	2024
Survey-evidence implied TMR	6.18%	4.80%	4.71%	6.27%	7.65%	7.55%

Source: KPMG analysis

390. The table shows that the required TMR for 2024 has increased by 1.37% since 2019 which is when the allowed return for AMP7 was set. Our estimate of the TMR for AMP8 is broadly the same as that the CMA set for AMP7. This suggests that our estimate of the TMR is conservative which supports the case for aiming up.

Statistical uncertainty in parameters

391. The true values for each parameter in the CAPM are unobservable and so these must be estimated. The estimates of the parameters are subject to statistical uncertainty as it cannot be known how close these are to the unobservable true values. The statistical uncertainty is reduced but still exists even where robust methodologies are adopted for estimating the parameters. For example:

- The estimate of the beta is derived from a regression of market returns against water stock returns. The regression provides an unbiased and consistent estimate of the true beta. However, it is subject to statistical uncertainty as reflected in the standard error and confidence internal for the regression; and
- The estimate of the TMR is based on a sample mean over a specified period. The sample mean is an unbiased and consistent estimate of the true population mean. However, the sample mean may vary if a different period is used which shows that it is subject to statistical uncertainty.

392. KPMG[171] has developed ranges for the estimates of each parameter; the ranges reflect the statistical uncertainty in the estimates of each parameter. It combined the ranges across

[169] KPMG, August 2024, Estimating the Cost of Equity for PR24, table 43, SOC-7-0050.
[170] P. Fernandez et al., April 2024, Survey: Market Risk Premium and Risk-Free Rate used for 96 countries in 2024, page 2, SOC-7-0064.
[171] KPMG, March 2025, Estimating the Cost of Capital for PR24, section 10.1.I and footnote 242, SOC-7-0034.

parameters using the CAPM formula to form a cost of equity distribution. The P50 of the distribution is 6.18% and the P25-P75 range spans 5.19-7.13%[172]. This is based on a data cut-off date of January 2025 at 60% gearing.

393. The P75 implies aiming up of 0.74% to our estimate of the cost of equity.

3.3.6 Debt financeability

394. The CMA at PR19 considered financeable to mean that: "*a water company that is operating efficiently is able to earn a reasonable return and therefore to cover the costs of financing both existing and new investment*"[173]. Ofwat has a duty to secure that water companies are financeable.

395. Ofwat describes financeability as an assessment of whether the notional company is able to generate sufficient cashflows to meet its financing needs under the regulatory determination[174]. For debt financeability, Ofwat assesses the notional company's projected credit ratios against the rating thresholds set out by the rating agencies. This is important given the license condition to maintain an investment grade rating.

396. The assessment of debt financeability should comprise two tests[175]:

- The notional company should be able to achieve the notional rating of Baa1/BBB+; and
- The notional company should be able to withstand plausible downside shocks without its rating falling below Baa2/BBB (negative outlook).

397. The lowest investment grade rating of Baa3/BBB- is not an appropriate threshold because it is associated with a significantly higher cost of debt. Further, a threshold Baa2/BBB (negative outlook) is consistent with Ofwat's revised license lock-up condition, below which it considers financial resilience is impaired.

398. There is a higher hurdle for passing the tests for debt financeability at PR24 than at PR19. This is because Moody's increased its rating thresholds by half a notch in response to Ofwat's DD. S&P increased its rating thresholds by a full notch and Fitch by between half to a full notch in response to Ofwat's FD.

399. The CMA at PR19 used debt financeability as a meaningful cross-check for the cost of equity because:

- *"We consider financeability to provide a relevant cross-check on the choice of the cost of equity. The use of credit ratios at least provides a check on whether the cost of equity appears to be of a level which is broadly consistent with the high-quality credit ratings required by Ofwat and implied in the cost of debt"*[176]*;* and

[172] The P25-P75 range provides a robust range for the cost of equity. It represents the central 50% of cost of equity values in the distribution and therefore excludes outliers.
[173] CMA, March 2021, Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations - Final report, para 6, SOC-7-0023.
[174] Ofwat, December 2024, PR24 final determinations - Aligning risk and return – appendix, page 58, SOC-7-0065.
[175] See Chapter 1: Risk and financeability for further detail.
[176] CMA, March 2021, Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations - Final report, para 9.1399, SOC-7-0023.

- *"…there is uncertainty about the measurement of the required return, particularly the level of the cost of equity, as reflected by the use of a range. The financeability analysis therefore provides a valuable crosscheck on the point estimate for the cost of equity"* [177].

400. Moreover, the CMA at PR19 deemed that the allowed return is the starting point for securing debt financeability: *"Our starting point is that the WACC is the primary factor in the redetermination ensuring that an efficient firm can finance its functions. If the WACC is set at a level which properly reflects the cost of debt and cost of equity for the investors in the sector, both debt and equity investors will earn sufficient returns to cover the costs of financing, and therefore the companies will be financeable"* [178].

401. We have assessed what cost of equity a notional company with our specific characteristics requires to achieve debt financeability post-application of our proposed remedies[179]. Our assessment shows that a notional company with our specific characteristics requires a cost of equity[180] of 6.6% for Moody's and 7.3% for Fitch[181] to achieve a Baa1/BBB+ rating on the basis of metrics alone. This reflects the minimum cost of equity required for a Baa1/BBB+ rating i.e. implies no headroom.

402. We note that a notional company with our specific characteristics also requires a cost of equity of 8.3% to achieve a BBB+ rating with S&P. Additionally, it also requires a cost of equity of 7.2% for Moody's, 6.7% for S&P and 7.9% for Fitch to maintain a Baa2/BBB rating with 2% RoRE underperformance. These are not considered for aiming up because:

- A number of these datapoints are captured in the range of 6.6-7.3%;
- The cost of equity has been calibrated to achieve a Baa1/BBB+ rating on an average basis;
- The cost of equity required to achieve a BBB+ rating with S&P could indicate that RCV run-off rates are not consistent with asset lives; and
- The range of 6.6-7.3% would allow the notional company to retain a rating of at least Baa3/BBB- under 2% RoRE underperformance.

3.3.7 Fair bet

403. Investors will only commit equity where the price control constitutes a fair bet. In practice, a fair bet means that investors face a symmetric distribution of equity returns.

404. Conversely, a fair bet does not exist where investors face an asymmetric distribution of equity returns. Downward asymmetry in equity returns can arise in two forms:

- Expected loss – Investors cannot achieve the allowed return at the mean RoRE position. In other words, investors' expected return is below the allowed return; and
- Skewness – Investors do not have equal likelihood for upside and downside around the mean RoRE position. In other words, the P50 (median) RoRE position is lower than the mean.

[177] CMA, March 2021, Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations - Final report, para 10.73, SOC-7-0023.
[178] CMA, March 2021, Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations - Final report, para 10.72, SOC-7-0023.
[179] See Annex: Post-remedy PR24 calculations: financeability and retail allowances for further detail.
[180] This is the wholesale cost of equity and the assessment assumes there is no risk asymmetry.
[181] Issuer default rating.

405. The CAPM assumes that equity returns are symmetrically distributed. If these are asymmetrically distributed, an adjustment has to be made to the CAPM-implied cost of equity. The size of this adjustment is not constrained by the endpoint of the CAPM-implied range because asymmetry is outside of the CAPM.

406. Fair bet is not only a valuable cross-check but a necessary one for the CAPM as the CAPM does not price asymmetry. The fair bet principle is widely accepted across regulators. For example, Ofcom[182], the CAA[183] and the CMA[184] have applied the fair bet principle in previous determinations. The CMA at PR19 did not explicitly refer to the fair bet principle but its recognition that asymmetry should be priced is consistent with this.

407. Fair bet is particularly important at AMP8 as equity returns are more volatile than in previous AMPs. This is because companies face a step change in delivery risk and performance risk at AMP8.

408. We have undertaken risk analysis to assess whether the price control represents a fair bet for a notional company with our specific characteristics post-application of our proposed remedies[185]. The risk analysis shows that a notional company with our specific characteristics is exposed to (1) an expected loss at the mean RoRE position of 0.50%; and (2) downward skew of 2bps i.e. the P50 RoRE position is 2bps lower than the mean. As such, the price control is not a fair bet.

409. The asymmetry can either be mitigated or compensated to ensure the price control is a fair bet.

410. If the asymmetry is not mitigated, compensation for both the expected loss and downward skew is required to address the asymmetry. The compensation for asymmetry must be provided above any increases to the cost of equity implied by the other cross-checks i.e. it is a separate adjustment. Although the compensation for asymmetry is a separate adjustment, it is essential to supporting investment in the same way as the adjustments implied by the other cross-checks.

411. The compensation can be provided (1) as part of aiming-up in line with the CMA's approach to addressing asymmetry at PR19; or (2) through a separate allowance outside of the cost of equity.

3.3.8 Conclusion

412. Ofwat's allowed return is significantly downward biased. This means that Ofwat's aiming up serves only to reduce its downward bias rather than to promote investment as per its stated objective. In consequence, Ofwat has in error used aiming up as substitute for the robust estimation of parameters in the cost of equity.

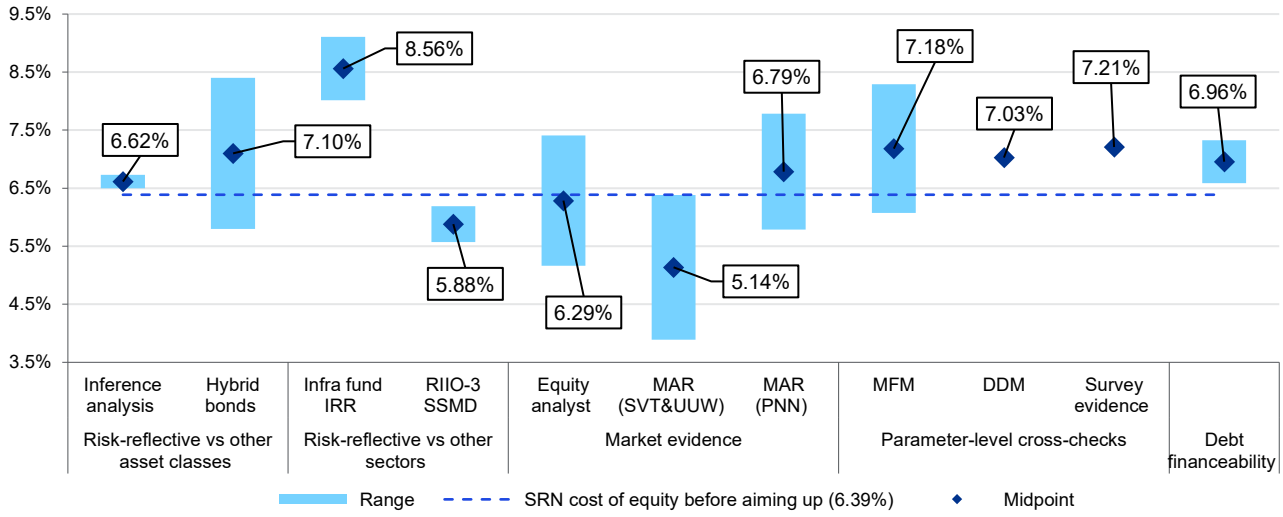
413. Our objective for aiming up, like Ofwat, is to promote investment. Unlike Ofwat, we have estimated the parameters in the cost of equity robustly which means that our aiming up in practice meets that objective. We have aimed up for a range of factors that are all critical to ensuring the allowed return promotes investment. These factors are set out below and build on the CMA's rationale for aiming up at PR19:

[182] Ofcom, August 2005, Approach to risk in the assessment of the cost of capital, para 3.14, SOC-7-0066.; Ofcom, March 2018, Wholesale Local Access Market Review: Statement – Volume 1 - Markets, market power determinations and remedies, para 9.10, SOC-7-0067.
[183] CAA, March 2023, Economic regulation of Heathrow Airport Limited: H7 Final Decision - Section 3 Financial issues and implementation, para 11.3, SOC-7-0024.
[184] CMA, November 2017, SONI Limited v Northern Ireland Authority for Utility Regulation - Final determination, para 7.237, SOC-7-0068.; CMA, October 2023, H7 Heathrow airport licence modification appeals, para 7.163, SOC-7-0044.
[185] See Chapter 8: Conclusion for further detail.

- Risk-reflective vs asset classes;
- Risk-reflective vs other sector;
- Market evidence;
- Parameter-level cross-checks;
- Debt financeability; and
- Fair bet.

414. We have a range of cross-checks for each factor. In the chart below, we have compared our estimate of the cost of equity before aiming up to the cross-checks for each factor, except for fair bet.

Figure 16: Southern Water cost of equity before aiming up vs cross-checks (CPIH-real, 60% gearing)



Notes: The cost of equity implied by DDM and survey evidence are based on combining KPMG's point estimates for RFR and beta with the CMA's PR19 TMR plus the movement implied by DDM/survey evidence
Source: Southern Water analysis based on KPMG and Frontier Economics reports[186]

415. The chart suggests aiming up of 0.50% to our estimate of the cost of equity before taking account of the fair bet principle. This results in a cost of equity of 6.89%.

416. The P25-P75 range for the CAPM-implied cost of equity after accounting for statistical uncertainty in the estimates of the CAPM parameters is 5.19-7.13%. Our estimate of the cost of equity after aiming up of 6.89% sits below the P75 at the P70. The CMA highlighted at PR19 that the New Zealand Commerce Commission sets the allowed WACC in energy close to the P70 (P67) of its WACC range[187]. It follows that our estimate is firmly within the CAPM range and is in line with regulatory precedent.

417. KPMG's risk analysis for a notional company with our specific characteristics shows downside asymmetric risk of 0.52%. In consequence, the price control is not a fair bet.

[186] See Southern Water, March 2025, WACC Data book, worksheet "C_Figure 16", SOC-7-0001.
[187] CMA, March 2021, Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations - Final report, para 9.1231, SOC-7-0023.

418. The downside asymmetric risk can either be mitigated or compensated to ensure the price control is a fair bet. If the downside asymmetric risk is compensated, it must be provided as a separate adjustment to the increases implied by the other cross-checks. Although the compensation for the downside asymmetric risk is a separate adjustment, it is essential to supporting investment in the same way as the adjustments implied by the other cross-checks.

419. The compensation can be provided (1) as part of aiming-up in line with the CMA's approach to addressing asymmetry at PR19; or (2) through a separate allowance outside of the cost of equity.

3.3.9 Proposed remedy

420. Ofwat has erred in its estimate of aiming up for the reasons outlined above.

421. We estimate that aiming up of 0.50% is required to our estimate of the cost of equity. This results in a cost of equity of 6.89%. We assume the downside asymmetric risk of 0.52% is compensated outside of the cost of equity. This could be through a 0.52% asymmetric risk premium on top of the cost of equity.

422. We request that the CMA redetermines the aiming up and provides a separate asymmetric risk premium for a notional company with our specific characteristics in line with our estimates.

3.4 Cost of debt

3.4.1 Summary of errors

423. The allowed return on debt does not provide for efficient debt costs. This is because it:

(1) Does not reflect the actual debt costs of the sector average company which is Ofwat's proxy for the notional company; and
(2) Does not take into account factors outside of company control.

424. Ofwat's technical errors by cost of debt parameter are set out in table below. The table categorises whether each technical error relates to (1) or (2).

Table 8: Ofwat's technical errors in estimating the allowed return on debt

Parameter	Error no.	Error	Category of error
CoD_E	CoD_E error 1	CoD_E is based on an 'all-in' cost that excludes swaps even though swaps are actively used by the sector for efficient purposes	Not reflective of sector average company
	CoD_E error 2	CoD_E places weight on the 'actual-notional' cost rather than sole weight on the 'all-in' cost. If sole weight is not placed on the 'all-in' cost, the allowance will underfund the sector average company's actual cost of embedded debt	
	CoD_E error 3	CoD_E assumes that the gap between an individual company's actual cost and the allowance is solely due to management inefficiency. In practice, an individual company's actual cost is driven by a range of factors that are not completely within management control. As such, it is wrong to allocate 100% of the risk between allowance and actual costs to companies	Factors outside of company control
CoD_N	CoD_N error 1	CoD_N is based on secondary market analysis of Baa1/BBB+ water bonds but this analysis does not control for tenor	Not reflective of sector average company
	CoD_N error 2	CoD_N assumes that the notional company can achieve a Baa1/BBB+ rating but in practice the notional company is likely to be closer to Baa2/BBB	
Share of new debt	Share of new debt error 1	Share of new debt is based on a calculation that contains errors, outdated data, internal inconsistencies. This results in share of new debt below that for the sector average company	Not reflective of sector average company
	Share of new debt error 2	Share of new debt is based on the RCV growth of the sector average company. We have a capital programme that is the largest in the sector in terms of RCV growth. This is outside of our control and as such, our share of new debt should reflect our company-specific RCV growth	Factors outside of company control
CoD_A – basis risk	Basis risk error 1	Ofwat has implemented a full transition to CPIH which introduces additional financing risk and cost for companies. Ofwat has not provided an allowance to manage these additional risk/costs even though its decision was outside of company control	Factors outside of company control
CoD_A – cost of carry	Cost of carry error 1	The cost of carry does not reflect prefinancing for maturing debt	Factors outside of company control
	Cost of carry error 2	The cost of carry assumes that the RCF is available only to support prefinancing and not unforeseen circumstances	
	Cost of carry error 3	The cost of carry does not reflect forward-looking expectations of interest rates	
CoD_A – liquidity cost	Liquidity cost error 1	The liquidity cost is based on inputs from the DD rather than the FD	Factors outside of company control

Source: Southern Water analysis

425. As the allowed return does not fund efficient debt costs, it means that the equity return has to subsidise debt costs at the expected position for debt performance. This does not provide a fair bet on debt performance for equity investors. Equity investors will not allocate new capital to the water sector on this basis. This means that allowed return on debt is not financeable.

426. Relatedly, setting an allowed return that underfunds debt costs introduces wrong incentives. Specifically, it disincentives companies from investing as not investing minimises their requirement for new debt and thus their level of underfunding. An outcome where companies are discouraged from investing is harmful to customers.

3.4.2 Cost of embedded debt

427. Ofwat provides separate allowances for the cost of embedded and new debt. The cost of embedded debt is the cost of debt raised before AMP8 but that remains on balance sheet for at least part of AMP8.

428. Ofwat has estimated the cost of embedded debt using the balance sheet approach. Under Ofwat's specification of the balance sheet approach, it places equal weight on the 'all-in' and 'actual-notional' cost of the median company across the WaSC and large WoC group. It excludes swaps and debt instruments it considers are non-standard such as junior debt.

In-principle errors implied by Ofwat's balance sheet approach

429. Ofwat's balance sheet approach has a number of in-principle errors which are set out below.

(a) Ofwat's exclusion of certain debt instruments[188] departs from the CMA's position at PR19. The CMA also used a balance sheet approach but included the cost of all debt instruments;
(b) Ofwat has specified the notional company for its balance sheet approach ex-post and this does not resemble any one or the average company in the sector;
(c) Ofwat's exclusions to company balance sheets are one-sided in that it does not reflect what the plausible counterfactual would have been if the company had not issued the 'excluded' debt;
(d) Ofwat has effectively carried out a downside-only ex-post review of the sector's actual cost as its exclusions to company balance sheets seem only to decrease costs. It does not appear to have carried out a balanced assessment which could result in exclusions that both increase and decrease costs; and
(e) Ofwat's balance sheet approach 'double notionalises' the sector's actual cost: (1) the 'all-in' cost is based on instruments that Ofwat considers would have been issued by the notional company. It follows that despite being labelled an 'all-in' cost, it is a notional cost; and (2) the 'actual-notional' cost is based on superimposing the notional debt mix on the already notional 'all-in' cost.

430. In-principle errors (a)-(d) underpin CoD_E error 1 and in-principle error (e) underpins CoD_E error 2.

431. The implication of these errors is that the balance sheet estimate underfunds the sector's actual cost. This contravenes the principle underpinning the balance sheet approach, like other sector average approaches, that the sector's actual cost is the proxy for the efficient cost.

[188] Ofwat excludes swaps, junior debt, intercompany loans, debenture stock, preference shares and liquidity facilities in its calculation of the 'all-in' cost.

CoD_E error 1: Treatment of swaps

432. Ofwat in error has included only the cost of cross-currency swaps in the 'all-in' cost. However, the cost of all swaps should be included in the 'all-in' cost for the reasons set out below.

433. First, the sector routinely uses swaps and thus considers swaps to form part of an efficient strategy.

434. Second, the sector uses swaps for efficient purposes:

- Interest rate swaps to hedge the cost of new debt allowance;
- Inflation swaps to (1) raise synthetic index linked debt during times of illiquidity in the direct debt market; (2) achieve cheaper pricing than in the direct debt market; and (3) hedge RPI-CPIH basis risk; and
- Cross-currency swaps to hedge currency risk on foreign bonds. Companies raise debt in foreign debt markets to widen their investor pool and in turn achieve cheaper pricing.

435. There are a small number of swaps that have been used for cash profiling which could distort debt costs over time. However, the cash profiling component was removed in KPMG's analysis[189].

436. Third, Ofwat appears to have determined ex-post that swaps would not have been issued by the notional company. This is because Ofwat only explicitly considered swaps for the first time at PR19 and in any case its decision to exclude swaps at PR19 was ultimately overturned by the CMA. In addition, Ofgem ensured that swap costs were covered by its cost of debt allowance at RIIO-2.

437. Relatedly, it is difficult to reconcile Ofwat's decision with its long history of recognising the importance of swaps as a valid means of hedging inflation, interest rate and currency risk. Companies may have interpreted this past recognition as support for using swaps. As such, Ofwat's exclusion of swaps at PR24 could be seen as extracting the realised benefits of swaps ex-post.

438. Fourth, if Ofwat decides to exclude swaps, it should put in place a plausible counterfactual which would similarly have achieved companies' risk management objectives at the time. For example, it should replace a synthetic index linked bond (via fixed rate bond plus inflation swap) with a direct index linked bond. However, this counterfactual is likely to be more expensive than the factual.

439. Ofwat indicated in the DD that swap costs (excluding cash profiling) are 11bps based on a reconciliation between its own model and KPMG's analysis[190].

CoD_E error 2: Role of the 'actual-notional' cost in the balance sheet approach

440. Ofwat places weight on the 'actual-notional' cost on the basis this aligns with its long standing principle that companies are responsible for their own financing choices. However, this is in error.

441. Companies cannot change their past decisions (embedded debt), only their future decisions (new debt) which implies there is a limited efficiency incentive of including the 'actual-notional' cost. Instead, its inclusion could mean that companies are underfunded for their actual cost.

[189] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 11.1.67, SOC-7-0034.
[190] KPMG, August 2024, Cost of Embedded Debt – analysis of and commentary on Ofwat's PR24 DD position, page 11, SOC-7-0069.

442. There are two further reasons why no weight should be placed on the actual-notional cost.

443. First, the 'actual-notional' cost does not solely adjust a company's portfolio for the notional debt mix. It also adjusts for timing of issuance. In consequence, it does not fulfil the purpose for which it was designed.

444. Second, the 'actual-notional' cost provides a misleading view of the sector's actual cost:

- Ofwat's 'all-in' and 'actual-notional' cost differs by 0.13% in nominal terms at the sector-level. The differences are far more material at the company-level; up to 0.82% in nominal terms[191];
- Ofwat's 'all-in' cost and 'actual-notional' cost are both variants of a notional cost so provide limited insight about the sector's actual cost; and
- KPMG's 'all-in' cost closely proxies the actual sector cost. KPMG's analysis indicates that 'all-in' and 'actual-notional' costs vary materially at both the company- and sector-level[192].

445. Ofwat notes that the CMA made use of the 'actual-notional' cost at PR19. However, Ofwat's specification of the 'actual-notional' cost differs from that of the CMA at PR19. In particular, Ofwat's specification reflects 'double notionalisation' (as explained above), whereas the CMA adjusts only for the notional debt mix. Hence, Ofwat is wrong as its specification of the 'actual-notional' cost has a higher degree of notionalisation than the CMA.

446. Further, (1) unlike Ofwat, the CMA did not mechanistically reflect the 'actual-notional' cost in its point estimate for the cost of embedded debt; and (2) all of the CMA's approaches for estimating the cost of embedded debt landed at similar values. This means that the actual-notional cost did not necessarily play a significant role in the CMA's estimate of the cost of embedded debt.

447. KPMG[193] updated Ofwat's cost of debt model to reflect a data cut-off date of January 2025. This increases the balance sheet estimate of the cost of embedded debt by 1bp. KPMG then formed the balance sheet estimate in the updated model by placing sole weight on the 'all-in' cost and no weight on the 'actual-notional' cost instead of placing equal weight on both. This increases the cost of embedded debt by 6bps.

Proposed remedy

448. Ofwat has erred in its estimate of the cost of embedded debt (4.82% in nominal terms) for the reasons outlined above. KPMG has amended Ofwat's calculation to correct for these errors.

449. KPMG has made the following amendments to Ofwat's calculation and estimates a cost of embedded debt of 5.00% in nominal terms (2.94% in CPIH terms[194]):

- Update Ofwat's cost of debt model to reflect a data cut-off date of January 2025 (+1bp);
- Place sole weight on the 'all-in' cost and no weight on the 'actual-notional' cost (+6bp); and
- Include swaps in the 'all-in' cost based on Ofwat's DD reconciliation (+11bps).

450. We request that the CMA redetermines the cost of embedded debt in line with KPMG's estimate.

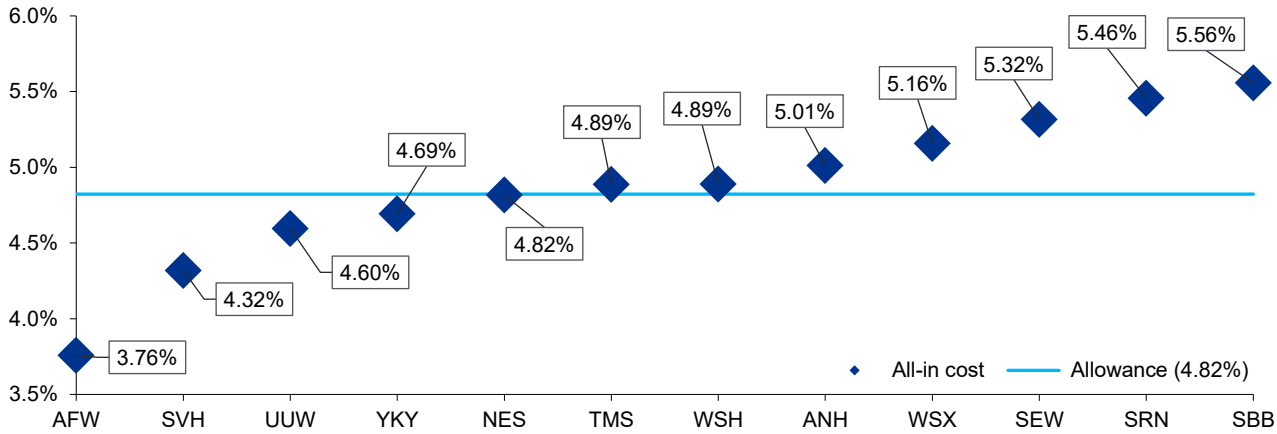
[191] Ofwat, December 2024, PR24-FD-RR02-Cost-of-debt, SOC-7-0070.
[192] KPMG, August 2024, Cost of Embedded Debt – analysis of and commentary on Ofwat's PR24 DD position, page 27, SOC-7-0069.
[193] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 11.1.4, SOC-7-0034.
[194] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 11.5.1, SOC-7-0034.

451. Further updates to Ofwat's calculation are also required to reflect FY25 APR data as this becomes available. We expect that this is likely to put upward pressure on KPMG's estimate.

3.4.3 Cost of embedded debt sharing factor

452. There is a wide range of actual cost of embedded debt positions across the sector as shown in the chart below. The range between the lowest and highest position is 3.76-5.56%.

Figure 17: Distribution of 'all-in' cost of embedded debt across larger companies at AMP8 (nominal)



Notes: Ofwat excludes swaps, junior debt, intercompany loans, debenture stock, preference shares and liquidity facilities in its calculation of the 'all-in' cost
Source: Southern Water analysis based on data from Ofwat PR24 FD cost of debt model[195]

453. As the cost of embedded debt allowance is a sector average, it structurally overfunds and underfunds companies for their actual costs.

454. Companies that are underfunded need to use the equity return to subsidise their actual costs to secure their financeability. These companies may be at risk of rating downgrades which will increase their cost of raising debt in future. This will perpetuate their current underfunding on embedded debt and widen the range of embedded debt positions across the sector in future AMPs.

455. Companies may be wrongly underfunded under the allowance because the allowance does not recognise that actual cost positions are driven in part by factors outside of company control. Hence, the allowance may be rewarding/penalising companies for factors outside of their control rather than for management decisions. The factors outside of company control are set out below.

CoD_E error 3: Factors outside of company control

Market environment

456. Companies are price takers in global debt markets so have no special ability to predict or influence market rates. In other words, variations in market rates are outside of company control.

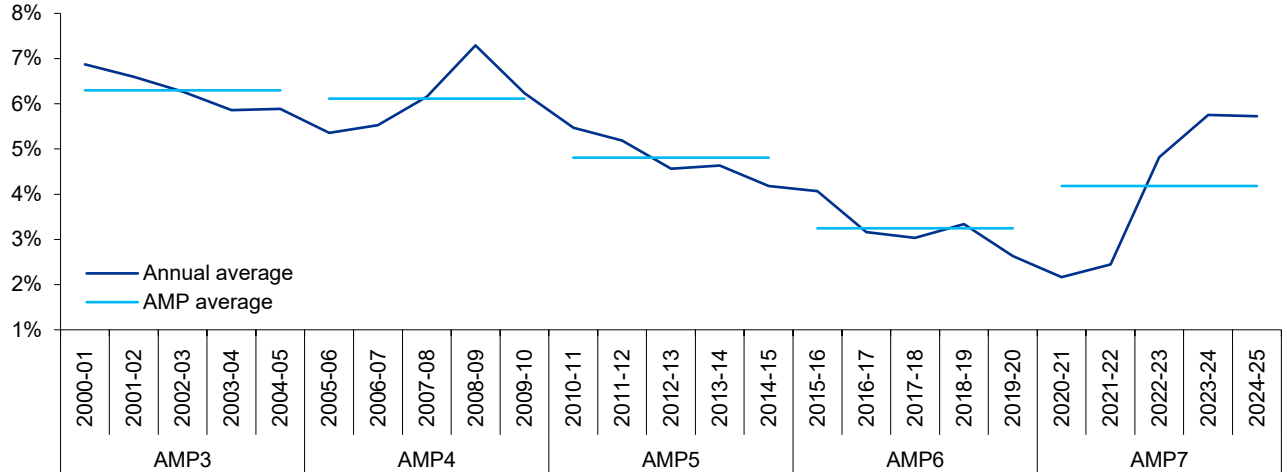
457. Variations in market rates are a material driver of the cost of debt. If interest rates and inflation were flat over time, all companies would have the same cost of debt assuming they have the same

[195] Southern Water, March 2025, WACC Data book worksheet "C_Figure 17", SOC-7-0001.

credit rating. This is because (1) index linked debt and floating rate debt would effectively become forms of fixed rate debt as market rates are fixed; and (2) inflation and term premia would no longer be necessary for the same reason. However, in practice, market rates vary over time and over the last 25 years have varied significantly.

458. For example, interest rates have varied significantly across and within price controls over PR99 to PR19 as shown in the chart below. In particular, there was a consistent reduction in interest rates following the financial crisis in PR04 but this has completely reversed at PR19. At PR19, interest rates began at an all-time low but have since increased rapidly to levels that have not been observed since around the time of the financial crisis.

Figure 18: Evolution of iBoxx A/BBB 10Y+ yields over AMP3-AMP7 (nominal)



Source: Southern Water analysis based on LSEG data[196]

Timing of issuance

459. As market rates vary over time, the timing of debt issuance has a material impact on the cost of debt particularly where there are step changes in market rates. Companies' ability to control timing of issuance is constrained by their capex and refinancing requirements. These cannot be funded too early (without unavoidable carry costs) or deferred for too long (without compromising delivery of mandated capital programmes and defaulting on debt maturities). Further, companies have generally had limited ability to optimise timing of issuance over a long-term basis given uncertainty around capex requirements in future AMPs. It follows that timing of issuance is not completely within company control.

Regulatory policy

460. Companies are expected to issue debt on a basis that hedges the cost of debt policy which means their actual costs are directly influenced by the cost of debt policy. However, the cost of debt policy is entirely Ofwat's decision and is hence outside of company control.

461. In addition to affecting companies' debt cost, the cost of debt policy affects their debt performance. This is because companies generally issue long-dated debt instruments, which span multiple AMPs, to match their long-life assets but the cost of debt policy is inconsistent across AMPs. This

[196] Southern Water, March 2025, WACC Data book worksheet "C_Figure 18", SOC-7-0001.

means debt instruments that hedged the policy in place at the time of issuance may not hedge the current policy. As such, these instruments can be underfunded due to a change in policy which is outside of company control.

Risk sharing mechanisms

462. The regulatory framework includes risk sharing mechanisms across a number of areas to account for factors outside of company control, which are set out below. This does not include the cost of embedded debt but does include other costs such as totex.

- Indexation of allowed revenues to CPIH provides protection from inflation;
- Indexation of the cost of new debt provides some protection from changes in interest rates;
- RPEs provide some protection from mismatches between inflation and changes in input prices;
- Totex sharing provides some protection from the cost uncertainty associated with new projects;
- ODI sharing rates are calibrated to reflect the degree of company control over the PC; and
- Uncertainty mechanisms allow for changes in operating conditions.

463. In this context, Ofwat is wrong to not have applied a risk sharing mechanism on the cost of embedded debt. This is because it has not adjusted the cost of embedded debt for factors outside of company control. It is also inconsistent with its approach to risk allocation in other areas.

464. An appropriate risk sharing mechanism for the cost of embedded debt is a sharing factor as is applied to other costs like totex. The sharing factor on the cost of embedded debt could be designed differently to that for totex. In particular, the sharing factor on totex is between companies and customers whereas the sharing factor on the cost of embedded debt could be across companies.

465. Companies that are overfunded are only in this position because other companies with higher costs increase the sector average and so the allowance above their actual cost. Sharing across companies reallocates some of the allowance from companies that are overfunded to those that are underfunded.

466. The sharing factor above is justified based on the assessment against robust economic criteria below.

Assessment of the sharing factor against robust economic criteria

467. Risk allocation – the sharing factor above does not allocate new risks to customers, rather it reallocates risk across companies. In fact, it may serve to reduce risk to customers as it improves the financeability of companies that are underfunded. Further, a sharing factor more closely reflects a fair bet on debt performance for equity investors in these companies. This is because it reduces the level of underfunding at the expected position for embedded debt performance. As well as supporting a fair bet, it narrows the distribution for embedded debt performance, thereby improving the certainty of returns for equity investors.

468. Separately, an important difference between debt costs and other costs is that (1) on other costs, companies are only penalised for overspend within the AMP; but (2) on debt costs, they can be

penalised for relatively expensive debt over multiple AMPs. A sharing factor lessens but still preserves this difference.

469. Incentive properties – companies cannot change their embedded debt positions so there is limited incentive benefit of underfunding companies for their actual cost of embedded debt. A sharing factor implies the right incentives to issue debt efficiently as (1) companies retain exposure to management decisions e.g. debt strategy choices; but (2) companies are less exposed to factors outside of their control. A sharing factor may also dampen the perverse incentives to not invest for companies that are underfunded as it reduces their level of underfunding. This is in the interest of customers.

470. Predictability and stability of regulatory policy – the cost of debt policy has not been static and in some ways has evolved over time to adjust for factors outside of company control, such as, the introduction of cost of new debt indexation. A sharing factor on embedded debt is a further evolution of this. Moreover, a sharing factor may support the continued usage of a sector average policy in future AMPs as it narrows the range of funding positions on embedded debt across the sector. Separately, sharing factors are normal for other costs, like totex, which recognises that costs are not completely in company control. Applying a sharing factor on embedded debt aligns the policy on debt costs with other costs.

471. Consistency with competitive markets – regulation is designed to proxy competitive market outcomes. In competitive infrastructure markets, a higher cost of debt is at least partly in the short term and fully in the long term reflected in prices. This is because equity investors in contestable infrastructure assets are typically unwilling to accept the risk that revenues may not cover costs. In contrast, the sector average policy fully exposes equity investors in regulated infrastructure assets to the higher cost of debt. A sharing factor does not perfectly but does more closely proxy the competitive market outcome. This is as it does not allow for full recovery of debt costs in the long-term but does allow for partial recovery in the short- and long-term.

472. Financeability – as debt in the sector is long-dated and market rates are volatile, it takes several AMPs for companies that are underfunded to converge to the sector average. Over this long window, companies that are underfunded may struggle to pay dividends and face rating downgrades. This reduces the attractiveness of these companies to equity and debt investors which in turn increases their WACC. A sharing factor on embedded debt supports financeability for these companies by reducing their level of underfunding.

473. Ofwat previously considered applying a sharing mechanism to the cost of debt in PR19. It encouraged companies to consider a sharing mechanism on the cost of debt in their PR19 business plans where this was in the interest of customers[197]. The assessment above confirms this is strongly in the interest of customers.

474. Ofwat also recognised some of the benefits of a sharing mechanism on the cost of debt, in particular, that it ensures a common approach across totex and financing costs:

> *"…mandatory risk sharing would help ensure a consistent approach to risk sharing across companies and would be consistent with our approach to sharing out and under performance for totex, where company/customer share the up and downsides. It would also provide greater certainty around sharing of outperformance, whereas, without a risk sharing mechanism,*

[197] Ofwat, September 2016, Water 2020: consultation on the approach to the cost of debt for PR19, page 5, SOC-7-0071.

customers are dependent on Ofwat reflecting sector outperformance when price controls are reset"[198].

Quantification of the sharing rate based on a comparative assessment

475. We have carried out the same assessment to quantify the sharing rate for the cost of embedded debt. In particular, we have assessed the extent to which a range of relevant criteria impact the cost of embedded debt and other costs. This assessment is set out in the table below and the criteria considered are as follows:

- Controllability – Reflects the degree to which the company has control over the outturn cost;
- Uncertainty – Reflects the degree to which outturn cost can vary from the allowance in % terms; and
- Other regulatory mitigation – Reflects the degree to which companies are protected by other regulatory mechanisms besides cost sharing such as uncertainty mechanisms, RPEs and true-ups.

476. Ofwat has referred to controllability and uncertainty as criteria in its own qualitative assessment.

Table 9: Quantification of the sharing rate based on a comparative assessment

Criteria	Tax	Cost of embedded debt	Base expenditure	Enhancement expenditure	Business rates
Controllability ○ = 100% control ● = 0% control	◔	◑	◑	◑	◕
Uncertainty ○ = 100% certain ● = 0% certain	◔	◔/◑	◑	◕	◕
Other regulatory mitigation ○ = 100% additional mitigation ● = 0% additional mitigation	◑	●	◑	◑	●
Sharing rate	100:100	75:75	50:50	40:40	10:10

Note: Sharing rates are in the form (x:y) where x is the overspend borne by companies and y is the underspend retained by companies
Source: Southern Water analysis based on Ofwat PR24 FD

477. The table indicates that the level of sharing required for the cost of embedded debt lies between that for tax and base expenditure. Ofwat provides sharing rates of 100:100 for tax and 50:50 for base expenditure. The midpoint of this of 75:75 is an appropriate point estimate for the sharing rate for the cost of embedded debt.

478. This is conservative as the table indicates that the level for sharing on the cost of embedded debt should be closer to base expenditure than tax i.e. the sharing rate should be lower than 75:75. The sharing rate for the cost of embedded debt is symmetric to avoid introducing asymmetry into the price control package.

[198] Ofwat, September 2016, Water 2020: consultation on the approach to the cost of debt for PR19, page 36, SOC-7-0071.

Proposed remedy

479. Ofwat is wrong to assume that the gap between the allowed cost of embedded debt and an individual company's actual cost is solely due to management inefficiency. In consequence, Ofwat is wrong to allocate 100% of the risk between the allowance and actual costs to companies.

480. We request that the CMA redetermine the cost of embedded debt to include a sharing rate of 75:75.

481. We consider that it would be more appropriate for this sharing rate to be applied to an ex-ante estimate of our actual cost of embedded debt as opposed to using an ex-post true up.

482. We estimate that our actual cost of embedded debt is 6.04% in nominal terms[199]. This reflects a market data cut-off date of January 2025 and our current debt book but excludes the impact of cashflow profiling from our previous swap restructurings[200].

483. Based on KPMG's estimate of the cost of embedded debt of 5.00%, the 75:75 sharing factor would result in a cost of embedded debt allowance for Southern Water of 5.26%. This is 3.20% in CPIH terms.

3.4.4 Cost of new debt

484. The cost of new debt is the cost of debt raised over AMP8 to finance new capex and refinance embedded debt as it matures.

485. The cost of new debt contains two components:

(1) The yield on the benchmark index; and
(2) An adjustment over the yield on the benchmark index. A company with the notional rating of Baa1/BBB+ and issuing at a tenor in line with the benchmark index may only be able to issue at a premium (or discount) to the yield on the benchmark index. This premium/discount is reflected in (2).

486. On (1), Ofwat's choice of benchmark index is the iBoxx A/BBB 10Y+ index. KPMG has adopted the same index for its analysis as it provides a transparent and independent benchmark.

487. On (2), the adjustment should be estimated by comparing the yield on the benchmark index to notionally rated and maturity-matched water bonds in the primary or secondary market.

488. In practice, this is not possible as there are only a small number of bonds in the market that meet this requirement. As such, the adjustment is typically estimated by comparing the yield on water bonds to a rating- and maturity-matched iBoxx index. This is consistent with the approach adopted by the CMA at PR19.

489. It is more robust to rely on primary market bonds rather than secondary market bonds to estimate the adjustment. In other words, it is more robust to rely on yields at issue rather than traded yields. This is because yields at issue reflect the actual cost at which companies can raise new debt whereas they may not be able to raise new debt at traded yields. For example, yields at issue

[199] Southern Water, March 2025, Southern Water CoD Tool, worksheet "Scen_Mgr", SOC-7-0073.
[200] KPMG, 2024, Estimating the Cost of Embedded Debt and Share of New Debt for PR24 - Southern Water appendix, SOC-7-0072.

typically incorporate a yield premium over traded yields to incentivise participation in the newly issued bond.

490. KPMG has estimated the adjustment based on both primary market and secondary market water bonds[201].

Primary market

491. In the primary market, water companies were able to issue bonds on a rating- and maturity-matched basis in line with the benchmark index over AMP7 until November 2022. This was due to large sections of the economy being shut down during Covid-19; water yields at issue (and water betas) were depressed during this restrictions period.

492. Since November 2022, almost all new water bonds have been issued at a premium over the benchmark index. The average yield at issue on Baa1 water bonds (Moody's only[202]) has been 46bps higher than the contemporaneous yield on a maturity-matched iBoxx index over November 2022 to January 2025. Ofwat also adopted a starting point of November 2022 in the DD for its primary market analysis[203].

493. There have only been a few new water issuances following the FD and rating downgrades of Ofwat's framework. This means that primary market analysis may not reflect current investor perceptions of risk and therefore may not accurately reflect expected conditions over AMP8.

494. For this reason, KPMG has relied mainly on secondary market analysis to estimate the adjustment but uses the 46bps[204] estimate from the primary market analysis as a cross-check.

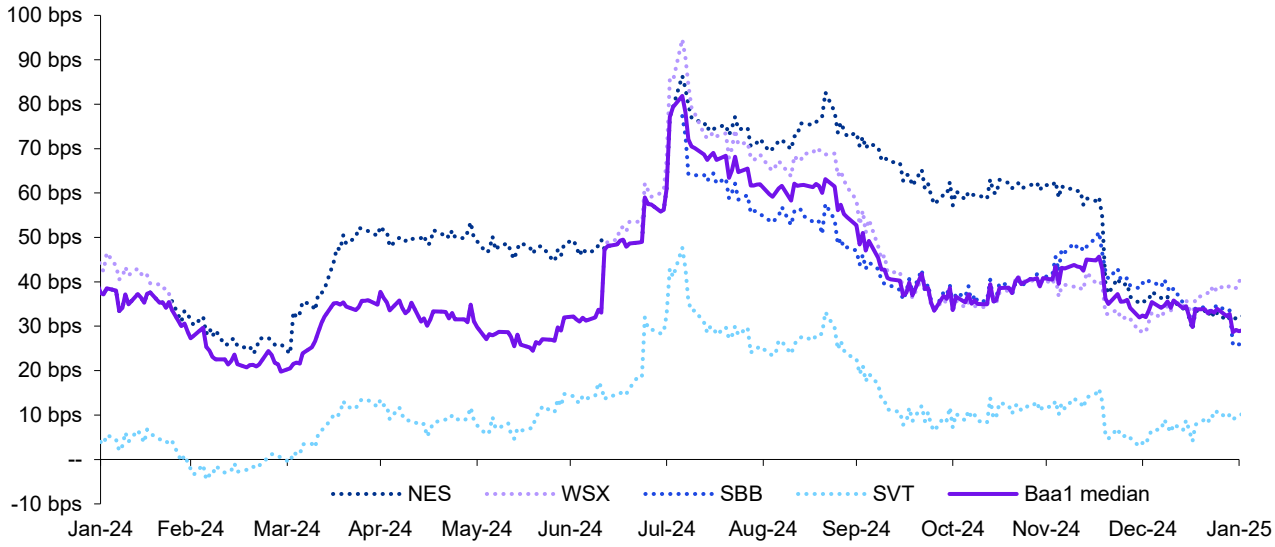
Secondary market - introduction

495. In the secondary market, KPMG has focused on Baa1 water bonds that were included in iBoxx BBB 10Y+ as at 31 January 2025[205]. It has examined the traded yields for these bonds over 2024 only in order to capture current market conditions.

496. The chart below compares over 2024 (1) the spread on these bonds to maturity-matched gilts by company; less (2) the spread on iBoxx A/BBB 10Y+ to maturity-matched gilts. Put differently, a positive value on the y-axis means that the spread on the Baa1 water bonds are higher than the spreads on the benchmark index. The chart shows that spreads on Baa1 water bonds relative to spreads on the benchmark index were particularly elevated around the DD but have reduced and stabilised at levels observed in January 2024.

[201] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 11.2.17, SOC-7-0034.
[202] KPMG focuses on Moody's for simplicity. Moody's rates more water bonds than the other rating agencies.
[203] Ofwat, July 2024, PR24 draft determinations - Aligning risk and return – Allowed return appendix, page 77, SOC-7-0045.
[204] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 11.2.16, SOC-7-0034.
[205] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 11.2.21, SOC-7-0034.

Figure 19: Spreads on Baa1 water bonds vs spreads on iBoxx A/BBB 10Y+ over 2024 (nominal)



Source: KPMG analysis

CoD_N error 1: Secondary market – Baa1 water bonds

497. Ofwat applied an upward adjustment of 30bps over iBoxx A/BBB 10Y+ based on secondary market analysis of Baa1/BBB+ water bonds. This analysis in error did not control for differences in maturity between the secondary market water bonds and the benchmark index.

498. KPMG has addressed this error in Ofwat's analysis and estimated an adjustment of 33bps based on the Baa1 median over January 2025 in the chart above.

CoD_N error 2: Secondary market – Baa2/BBB water bonds

499. Ofwat in error assumes that the notional company can achieve a Baa1/BBB+ rating. KPMG finds that it is unlikely that the notional company can maintain a Baa1/BBB+ rating across all three rating agencies on the basis of its cost of equity estimate. As such, the notional company may not be able to achieve a cost of new debt at a Baa1/BBB+ rating. For this reason, KPMG has considered Baa2 water bonds (Moody's only) that were included in iBoxx BBB 10Y+ as at 31 January 2025[206].

500. YKY bonds are rated as Baa2 by Moody's and were included in iBoxx BBB 10Y+ as at 31 January 2025. YKY bonds are rated as BBB+ by S&P and Fitch. This means YKY bond spreads fall between Baa1/BBB+ and Baa2/BBB ratings which may be most relevant for the notional company for AMP8. The spreads on YKY bonds were 59bps above the spreads on iBoxx A/BBB 10Y+ over January 2025.

Proposed remedy

501. Ofwat has erred in its estimate of the adjustment over iBoxx A/BBB 10Y+ for the reasons outlined above. KPMG has undertaken analysis that corrects these errors.

[206] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 11.2.24, SOC-7-0034.

502. KPMG's secondary market analysis indicates an adjustment over iBoxx A/BBB 10Y+ of 30-50bps. The primary market analysis provides a cross-check and indicates an adjustment of 46bps which is within the range. KPMG has selected a point estimate at the midpoint of the range of 40bps.

503. It follows that a notional company issuing at a tenor in line with the benchmark index could only achieve yields of 40bps above iBoxx A/BBB 10Y+. Applying this adjustment to the yield on iBoxx A/BBB 10Y+ over January 2025 implies a cost of new debt of 6.46%. This is 4.37% in CPIH terms.

504. We request that the CMA redetermines the cost of new debt in line with KPMG's estimate.

3.4.5 Share of new debt

505. The share of new debt represents the quantum of new debt that the notional company has to raise over AMP8 to refinance maturity debt and finance new capex. The cost of embedded debt and cost of new debt are weighted by the share of new debt to derive the base allowance.

506. Ofwat has estimated a share of new debt for the sector average company of 24%.

Share of new debt error 1: Share of new debt for the sector average company

507. KPMG has reviewed Ofwat's calculation for estimating the share of new debt for the sector average company. It has identified a series of errors which it has corrected. These are set out in the table below. KPMG's corrections increase the share of new debt from 24% to 28%[207].

Table 10: Errors in Ofwat's calculation of the share of new debt

Criteria	Ofwat	Assessment of Ofwat's calculation	KPMG
Refinancing of maturing debt	Based on a debt-weighted average of all companies	Inconsistent with the approach on the cost of embedded debt which is based on the median of larger companies	Based on the median refinancing of WaSCs and large WoCs
Financing of RCV growth	Based on 55% gearing	Inconsistent with the approach on the cost of embedded debt which is based on actual gearing	Based on the median actual gearing of WaSCs and large WoCs
Treatment of accretion	Includes accretion on both new and embedded debt in the new debt balance	Accretion on embedded debt should be reflected in the embedded debt balance and accretion on new debt should be reflected in the new debt balance. Ofwat's approach overstates the share of new debt	Based on the treatment on the left
Treatment of inflation	Includes accretion on debt balances but not on RCV balances	The calculation should be carried out consistently on a real or nominal basis. For the cost of debt, it is more intuitive for the calculation to be carried out on a nominal basis. This means that the calculation should be amended to use nominal rather than real RCV growth	The calculation is carried out on a nominal basis
RCV growth	5% real	Ofwat's input is based on outdated data supplied by companies before the DD. The input should be based on the capital programme allowed in the FD	Based on the median RCV growth rate over AMP8 (geometric mean) of WaSCs and large WoCs. This is 5.7% real or 8.1% nominal
Opening RCV	105.8bn (2024-25 CPIH)	Ofwat's input is based on data in business plans. The input should be based on the FD	103.7bn (2024-25 CPIH)

Source: KPMG analysis

Share of new debt error 2: Southern Water-specific RCV growth

508. Ofwat and KPMG have used a RCV growth rate for the sector average company to size the quantum of new debt that this company has to raise to finance new capex. Ofwat's growth rate equates to real RCV growth over AMP8 of 28% and KPMG's growth rate equates to 32%.

[207] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 11.3.4, SOC-7-0034.

509. Our real RCV growth over AMP8 is significantly higher at 59%[208]. Our RCV growth rate is outside of our control as it is driven by the capital programme mandated by regulation and statute for AMP8. As such, our share of new debt should reflect our company-specific RCV growth rate. It follows that Ofwat has in error not reflected factors outside of company control in its share of new debt for Southern Water.

510. As the cost of new debt is higher than the cost of embedded debt, an understated share of new debt will underfund our new debt. This disincentives us from investing as not investing limits our requirement for new debt and thus our level of underfunding. This is not in the customer interest.

511. We have adjusted KPMG's calculation for estimating the share of new debt for the sector average company to reflect our company-specific RCV growth rate. This uplifts KPMG's estimate of 28% to 36%.

Proposed remedy

512. Ofwat has erred in its estimate of the share of new debt as it is based on a calculation that contains errors, outdated data and internal inconsistencies. This results in a share of new debt below that for the sector average company.

513. KPMG has amended Ofwat's calculation to correct these errors and estimates a share of new debt for the sector average company of 28%.

514. In addition, Ofwat has erred in its estimate of the share of new debt as it has not reflected company-specific RCV growth rates which are outside of company control. We have adjusted KPMG's calculation to reflect our company-specific RCV growth rate which uplifts the estimate from 28% to 36%.

515. We request the CMA to redetermine the share of new debt in line with our estimate of 36%.

3.4.6 Additional borrowing costs – basis risk

Basis risk error 1: No allowance for basis risk

516. Ofwat has decided to fully transition the indexation of the RCV from RPI to CPIH at AMP8. This decision was outside of company control and introduces additional financing risk and cost for companies.

517. On embedded debt, the index linked debt in the sector is almost entirely RPI-linked. Ofwat's decision exposes companies to the mismatch between RPI-linked liabilities and CPIH-linked assets. On new debt, companies may seek to issue CPIH-linked debt at AMP8 as a response to Ofwat's decision to support asset-liability matching. CPIH debt markets are less liquid and so more expensive than RPI debt markets.

518. Ofwat has not provided for the additional risk on embedded debt or additional cost on new debt in the base allowance. The cost of embedded debt allowance reflects an RPI-CPIH wedge of

[208] Based on the real RCV growth profile in our Southern Water, June 2024, PR24 DDR financial model, SOC-7-0074.

90bps[209]. However, this 90bps is (1) below forecasts for the expected wedge over AMP8; and (2) does not provide for the risk that the wedge may deviate from the expected position based on its historical volatility[210]. The cost of new debt allowance assumes that the nominal cost of RPI-linked debt is the same as CPIH-linked debt. This does not account for the illiquidity premia in the cost of CPIH-linked debt over RPI-linked debt.

519. As Ofwat has not provided for basis risk in the base allowance, it should have provided a separate allowance for basis risk which it has not in error. Relatedly, as Ofwat has not provided for basis risk, it has contravened its own commitment to implement the RPI to CPIH transition in a neutral manner[211].

520. A company can choose either to bear or hedge basis risk. If the company bore basis risk, it would retain its embedded RPI-linked debt and issue new RPI-linked debt. If the company hedged basis risk, it would enter into basis swap overlays for its embedded RPI-linked debt and issue new CPIH-linked debt.

521. If the company bears basis risk, then this risk has to be priced. If the company hedges basis risk, then the cost of hedging this risk has to be funded.

Bearing basis risk

522. KPMG estimated the impact of bearing basis risk on the cost of debt for the notional company.

523. First, it modelled the impact of basis risk on the notional company's overall P10-P90 RoRE range forecast for AMP8. Assuming P10-P90 RoRE ranges are normally distributed, the standard deviation of returns for the notional company with basis risk is 1.08x higher than that without basis risk.

524. Second, basis risk is entirely systematic as it is driven solely by market-wide inflation. As such, KPMG used the logic in section 3.2.4 to uplift the beta and so the cost of equity to reflect the impact of basis risk. This increased the cost of equity by 25bps[212].

525. Third, it translated the increase in the cost of equity to the cost of debt using Ofwat's notional gearing. This implied an increase to the cost of debt of 20bps for the notional company.

Hedging basis risk

526. For embedded RPI-linked debt, 5Y basis swaps are the optimal hedge as (1) the debt itself is generally long-dated and hence cannot be restructured without significant cost; and (2) the debt will effectively transition to CPIH from 2030. Banks indicated to KPMG that basis swaps are only in RPI-to-CPI as the CPIH swap market does not exist. Bank quotes for 5Y RPI-to-CPI basis swaps were 7-12bps[213].

[209] In the risk-free rate, Ofwat uses a 20Y RPI-CPIH wedge of 33bps (September 2024 cut-off) to match the 20Y tenor of its risk-free rate proxy. In the cost of embedded debt, Ofwat uses a 5Y RPI-CPIH wedge of 90bps to match the 5Y window ahead of the 2030 RPI reform.
[210] KPMG, March 2025, Estimating the Cost of Capital for PR24, paras 11.4.31 and 11.4.32, SOC-7-0034.
[211] Ofwat, December 2015, Water 2020: Regulatory framework for wholesale markets and the 2019 price review, page 123, SOC-7-0075.
[212] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 11.4.40, SOC-7-0034.
[213] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 11.41.42, SOC-7-0034.

527. For new debt, companies are able to hedge basis risk by (1) directly issuing CPIH-linked debt; or (2) issuing fixed rate debt and entering into a fixed-to-CPI swaps. For (1), bank quotes for the illiquidity premia in the cost of CPIH-linked debt over RPI-linked debt was 9-13bps. For (2), banks indicated there is greater investor demand for inflation exposure in the swap market than the debt market. As such, the swap market may better accommodate the sector's financing needs at AMP8 than the debt market. Bank quotes for fixed-to-CPI swaps were 58-62bps[214]. KPMG produced an overall range of 11-60bps based on the bank evidence.

528. Based on a share of new debt of 28%[215] and notional proportion of index linked debt, KPMG translated its ranges above into uplifts to the cost of debt for the notional company. The cost of hedging basis risk on embedded debt is 2-3bps and on new debt is 1-6bps. KPMG selected a point estimate of 3bps across both ranges which sums to an overall point estimate of 6bps for the notional company.

529. The sector has a significantly higher proportion of index linked debt than is assumed for the notional company. Thus, 6bps represents a highly conservative cost for hedging basis risk for the sector.

Proposed remedy

530. Ofwat has set the allowed return on debt inappropriately low as it does not provide for basis risk either in in the base allowance or by way of a specific basis risk allowance.

531. KPMG adopted 6bps as the overall point estimate for managing basis risk at AMP8. This is based on the notional company hedging basis risk rather than bearing basis risk. The cost of bearing basis risk at 20bps is significantly higher than the cost of hedging basis risk at 6bps.

532. Ofgem provided energy networks an allowance for basis risk of 5bps in RIIO-2. KPMG's estimate of 6bps for water companies is reasonable compared to Ofgem's RIIO-2 allowance. It also reflects that the notional water company has a higher share of index linked debt than the notional energy company.

533. We request that the CMA redetermines the basis risk allowance in line with KPMG's point estimate.

3.4.7 Additional borrowing costs – cost of carry

534. Companies require liquidity ahead of need to ensure they can all times meet operational requirements. The cost of carry reflects the cost of issuing debt ahead of need. The cost of carry is the spread between the interest rate on the debt issuance and the deposit rate on the cash proceeds from the debt issuance. The cost of carry is incurred from the debt drawdown date until the need crystallises.

Ofwat's position

535. Ofwat's cost of carry is based on the following:

[214] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 11.41.43, SOC-7-0034.
[215] KPMG has estimated the basis risk allowance for the sector average company. We note our share of new debt based on our company-specific RCV growth rate is 36%.

- Companies do not prefinance maturing debt, only negative free cashflows resulting from capital projects i.e. the prefinancing amount is based only on negative free cashflows;
- For the prefinancing amount not covered by an RCF, companies prefinance this amount 12m ahead of need i.e. raise debt 12m ahead of when the need crystallises. For the prefinancing amount covered by an RCF, companies prefinance this amount 6m ahead of need;
- Companies have access to an RCF that is sized to cover liquidity requirements relating to financing negative free cashflows and refinancing maturing debt. The RCF is fully available to support prefinancing and is not available for any other purpose; and
- The cost of carry is 3Y average spread between spot rates on iBoxx A/BBB 10Y+ and overnight SONIA. iBoxx is the cost of new debt and SONIA is the deposit rate on the cash proceeds from new debt.

536. In combination, this means that companies prefinance negative free cashflows 6m ahead of need. The cost incurred over the 6m prefinancing period is 3Y average spread between iBoxx and SONIA.

537. We address the errors in Ofwat's position below.

Prefinancing period

538. For the prefinancing amount not covered by an RCF, the length of the prefinancing period is driven by factors outside of company control. These factors include rating agency criteria, going concern requirements, licence conditions:

- Rating agency criteria – Moody's and S&P require that companies have liquidity to meet cash outflows for at least the next 12m and 13.2m respectively to maintain an investment grade rating[216];
- Going concern requirements – FRS 102 requires that management make an assessment of the company's ability to continue as a going concern in the financial statements[217]. This assessment must cover a period of at least 12m from the date of the financial statements. In practice, this means at least 15m from the financial year end date as financial statements are published 3m after year end; and
- License conditions – Condition P/I requires that companies publish a ring-fencing certificate alongside the APR[218]. The certificate should state it is the opinion of the Board that the company has sufficient financial resources to carry out its regulated activities for at least 12m from the date of the APR.

539. Companies have set their liquidity policy to meet these requirements. WaSCs and large WoCs have policies of maintaining liquidity to cover cash outflows for the next 12-24m+[219].

540. KPMG has adopted a prefinancing period for the prefinancing amount not covered by an RCF of 12m for AMP8 like Ofwat[220]. This is conservative because:

[216] KPMG, March 2025, Estimating the Cost of Capital for PR24, paras 11.4.6 – 11.4.8, SOC-7-0034.
[217] Financial Reporting Council, September 2024, FRS 102 The Financial Reporting Standard applicable in the UK and Republic of Ireland, page 75, SOC-7-0076.
[218] Ofwat, February 2020, IN 20/01 Requirements and expectations for ring-fencing certificates, page 1, SOC-7-0077.
[219] KPMG, March 2025, Estimating the Cost of Capital for PR24, table 49, SOC-7-0034.
[220] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 11.4.18, SOC-7-0034.

- Several larger companies (UUW[221], YKY[222], TMS[223], SVT[224]) have adopted 15m+ as their liquidity policy;
- We are targeting 15m+ for AMP8 which is permitted under our liquidity policy of 12m+; and
- The macroeconomic environment is at present highly uncertain which suggests that a relatively prudent pre-financing period is required at AMP8. In this respect, UUW comments in its 2024 APR that it has the flexibility under its liquidity policy to exceed 24m in periods of greater uncertainty.

541. For the prefinancing amount covered by an RCF, KPMG had adopted a prefinancing period of 6m for AMP8 like Ofwat. This reflects efficient financial management to mitigate the risk that debt markets are unavailable or relatively expensive at the point the need crystallises.

Cost of carry error 1: Prefinancing need

542. Companies prefinance maturing debt as well as negative free cashflows resulting from capital projects. Companies to do not differentiate between these two prefinancing needs whereas Ofwat does in error. This is because rating agency criteria, going concern requirements and licence obligations require that companies have liquidity ahead of need in relation to both maturing debt and negative free cashflows.

543. Ofwat calculates that negative free cashflow represents 6% of total debt and the combination of negative free cashflows and maturing debt represents 12% of total debt.

544. Separately, Ofwat's calculation is in error based on DD inputs. KPMG has updated Ofwat's calculation for FD inputs which increases the 12% to 14%[225].

Cost of carry error 2: Availability and size of the RCF

545. Ofwat has sized the RCF to cover liquidity requirements related to financing negative free cashflows and refinancing maturing debt. Ofwat has assumed that the RCF is 100% available to support prefinancing. In combination, this means that companies only need to prefinance 6m ahead of need.

546. In practice, companies reserve a portion of the RCF to cover unforeseen circumstances such as operational shocks. This reflects efficient financial management. In addition, companies may not be able to secure RCFs with banks of the size modelled by Ofwat. Banks may be unwilling to provide such large RCFs to companies given the sector's credit risk and financial position over AMP8.

547. For these reasons, KPMG has assumed that only 50% of Ofwat's modelled RCF is available to support prefinancing. This means that 50% of the prefinancing amount is prefinanced 12m ahead of need and the other 50% is prefinanced 6m ahead of need. KPMG has also considered a sensitivity where 100% of the Ofwat's modelled RCF is available to support for prefinancing.

[221] United Utilities, Annual Report and Financial Statements for the year ended 31 March 2024, page 114, SOC-7-0078.
[222] Yorkshire Water, Annual Report and Financial Statements for the year ended 31 March 2024, page 124, SOC-7-0079.
[223] Thames Water, Annual Report 2023/24, page 140, SOC-7-0080.
[224] Severn Trent, Annual Report and Accounts 2024, page 99, SOC-7-0081.
[225] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 11.4.13, SOC-7-0034.

Cost of carry error 3: Cost of carry

548. Ofwat has calculated the cost of carry as 3Y average spread between spot rates on iBoxx A/BBB 10Y+ and overnight SONIA. This is in error for the following reasons:

- Ofwat has used a 3Y average of rates for cost of carry. In contrast, Ofwat has used a 1m average of rates for the risk-free rate, cost of embedded debt and to provide an ex-ante estimate for the cost of new debt. This reflects Ofwat's position that the latest rates provide the best guide for future rates. KPMG has used a 1m average of rates for the cost of carry to maintain consistency across the allowed return;
- Ofwat estimated the cost of new debt as iBoxx A/BBB 10Y+ plus 30bps. Hence, it should have used this estimate to calculate the cost of carry. KPMG estimated the cost of new debt is iBoxx A/BBB 10Y+ plus 40bps and has used this estimate to calculate the cost of carry; and
- Ofwat used the spot rate on overnight SONIA as the deposit rate. This does not reflect that iBoxx is a c.20Y rate whereas overnight SONIA is one-day rate. The spot rate on iBoxx captures rate expectations for the next 20Y whereas that on SONIA does not look past the given day. KPMG has used the forward rate on overnight SONIA to account for rate expectations over AMP8 as the spot rate on iBoxx does.

549. In sum, KPMG has calculated the cost of carry as the 1m average spread between the spot rate on iBoxx A/BBB 10Y+ plus 40bps and the forward rate on overnight SONIA. The spot rate on iBoxx A/BBB 10Y+ plus 40bps was 6.45% in nominal terms over January 2025. The forward rate on overnight SONIA was 4.08% in nominal terms over the same[226]. This results in a cost of carry of 2.38%.

Proposed remedy

550. Ofwat has erred in its estimate of the cost of carry for the reasons outlined above. KPMG has amended Ofwat's calculation to correct these errors.

551. KPMG has estimated a cost of carry of (1) 26bps where 50% of Ofwat's modelled RCF is available to support prefinancing; and (2) 17bps where 100% of Ofwat's modelled RCF is available to support prefinancing. KPMG has selected a point estimate of 22bps at the midpoint of the range.

552. We request that the CMA redetermines the cost of carry in line with KPMG's point estimate.

3.4.8 Additional borrowing costs – liquidity cost

553. Ofwat has assumed that companies maintain liquidity through an RCF.

554. Ofwat has assumed that the RCF is not drawn but simply remains available to support prefinancing. As such, it has provided the commitment fee for maintaining the RCF. Ofwat has provided for a commitment fee of 25bps which is the average commitment fee on RCFs across the sector based on APR data.

[226] KPMG has averaged 12m, 24m, 36 and 48m forward rates for overnight SONIA.

Liquidity cost error 1: Outdated data

555. Ofwat has sized the RCF to cover liquidity requirements related to financing negative free cashflows and refinancing maturing debt. Ofwat calculates that an RCF of this size represents 12% of total debt. Ofwat's calculation is in error based on DD inputs. KPMG has updated Ofwat's calculation for FD inputs which increase the 12% to 14%.

Proposed remedy

556. Ofwat has erred in its estimate of the liquidity cost as it has used outdated data. KPMG has amended Ofwat's calculation to correct for this error.

557. KPMG has estimated a liquidity cost of 4bps by multiplying the RCF size of 14% of total debt with the RCF commitment fee of 25bps[227]. We request that the CMA redetermines the liquidity cost in line with KPMG's estimate.

3.4.9 Required cost of debt

558. The table below compares our estimate of the cost of debt to Ofwat's allowed return. We have estimated the cost of debt in two stages. First, we estimate the cost of debt for the sector average company. Second, we layer on two company-specific positions that are grounded in the notional framework.

559. Our two company-specific positions are:

- 75:75 industry-wide sharing factor applied to the ex-ante estimate of our actual cost of embedded debt; and
- The RCV growth rate implied by our mandated capital programme in our share of new debt.

560. Ofwat's estimate of the cost of debt for the sector average company is 3.15% whereas our estimate is 3.71%. We have adopted Ofwat's estimate for issuance costs of 5bps. Our two company-specific positions result in a cost of debt for Southern Water of 3.99%.

561. We request that the CMA redetermines the cost of debt in line with our estimate of 3.99%.

[227] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 11.4.23, SOC-7-0034.

Table 11: Required cost of debt (CPIH-real)

Parameter	Ofwat FD: sector average	Southern Water: sector average	Southern Water: company-specific
Data cut-off date	**September 2024**	**January 2025**	**January 2025**
CoD_E	2.77%	2.94%	3.20%
CoD_N	3.74%	4.37%	4.37%
Share of new debt	24%	28%	36%
CoD_A – basis risk	0%	0.06%	0.06%
CoD_A – cost of carry	0.07%	0.22%	0.22%
CoD_A – liquidity cost	0.03%	0.04%	0.04%
CoD_A – issuance cost	0.05%	0.05%	0.05%
Overall cost of debt	**3.15%**	**3.71%**	**3.99%**

Source: Southern Water analysis based on KPMG report

3.5 Notional gearing

562. Ofwat has reduced notional gearing from 60% (per the CMA PR19 Redetermination) to 55% to increase the financial resilience of the notional company. This is in error for the reasons below.

563. First, Ofwat has increased business risk for the notional company but sought to offset the negative impact of this on the notional company's financial resilience by reducing its gearing.

564. A reduction in notional gearing does not improve a company's financial resilience at the enterprise level; rather it reallocates risk from debt to equity. It may worsen financial resilience at the enterprise level as, for example, ODI exposure increases mechanistically in proportion to the quantum of regulated equity.

565. Instead, the efficient market outcome for ensuring financial resilience at the enterprise level is to reflect the higher risk for the company in a higher cost of capital. In this context, Ofwat's beta wrongly assumes that risk will reduce at PR24 as it is lower than the corresponding beta at PR19.

566. Second, Ofwat has used notional gearing to solve financeability constraints in the notional company. This undermines the role of financeability as a meaningful cross-check on the calibration of the price control.

567. In this context, the notional company should be financeable at 60% gearing. This ensures that gearing has not been used to solve financeability constraints.

568. Third, Ofwat has used notional gearing to solve financeability constraints over successive price reviews. In particular, it reduced gearing from 62.5% to 60% at PR19 and from 60% to 55% at PR24.

569. The CMA allowed Ofwat's reduction at PR19. However, it would be inappropriate to endorse a repeat of this approach in PR24, especially at a rate of reduction that is double the reduction at

PR19 (2.5% at PR19 vs 5% at PR24). This would signal to Ofwat that it is appropriate to keep using notional gearing to solve financeability constraints.

570. Further, the CMA at PR19 did not consider there was evidence to justify an alternative level of notional gearing than 60% or that an alternative level of notional gearing would better serve customers. At PR24, the same remains true and a lower notional gearing may result in customer harm as explained below.

571. Fourth, a reduction in notional gearing increases the requirement for new equity capital. It is inherently more challenging for companies to secure new equity capital than debt capital. In consequence, a reduction in notional gearing increases the risk that companies are not able to secure the financing required to deliver the capital programme for AMP8. This is not in the interest of customers.

572. Fifth, a reduction in notional gearing may have unintended consequences, for example, it may increase agency costs. Any increase in agency costs would have to be funded through the allowed return. This is not in the interest of customers.

573. Agency costs are internal costs that arise when management and shareholders have conflicting interests. For example, a manager may obtain prestige from running a larger firm and so seek to grow the firm by wasting the firm's cash on negative NPV projects. This is not in the interest of shareholders as it reduces the firm's value. The manager's wasteful expenditure on negative NPV projects is an agency cost.

574. Debt prevents management from undertaking wasteful expenditure as the interest payments on debt reduce the cash available to management i.e. they have less cash to waste. Hence, a reduction in notional gearing may increase agency costs as it provides managers with more cash to waste.

575. Sixth, Ofwat estimated the cost of debt for the notional company using the actual cost of debt for the average company. To maintain consistency across the allowed return, Ofwat should place weight on actual RCV gearing levels across the sector in its estimate of gearing for the notional company. All companies in the sector, including those which have recently sought to de-gear, are geared above 55% and the sector average is 68.9%[228]. This market evidence from the sector therefore does not support a reduction in notional gearing.

576. S&P notes that: "*We anticipate that the amount of raised capital will fall short of Ofwat's assumptions, whose notional company gearing of 55% is expected to remain far from any actual company's gearing which is projected to be significantly above this over AMP8*"[229].

577. Ofwat considered that its reduction to notional gearing was supported by market evidence from: (1) EV gearing of listed UK water companies; (2) RCV gearing for GB energy companies; and (3) EV gearing for European energy companies. However, evidence from UK water companies is more relevant than other sectors. RCV gearing is the relevant measure for Ofwat's stated objective of financial resilience as it is RCV gearing, not EV gearing, that used as part of rating agency assessments. As explained above, RCV gearing for UK water companies does not support a reduction in notional gearing.

[228] Median of WaSCs and large WoCs (i.e. excludes PRT, SSC, SES and Tideway) as at 31 March 2024 based on Ofwat's MFR 2024. SVE and HDD were combined into SVT.
[229] S&P, February 2025, U.K. Water Regulatory Framework Support, Low Financial Flexibility In Coming Regulatory Period Drive Rating Actions, page 2, SOC-1-0013.

578. Lastly, the rating methodologies for Moody's and Fitch place significant weight on RCV gearing and coverage metrics such as AICR. These are largely independent constraints on ratings. 60% gearing typically implies a Moody's and Fitch rating of A3/A-[230]. This suggests that gearing is not a constraint for the notional company. Rather, the notional company is unable to achieve the target rating under the FD as it is constrained by coverage metrics. This is a result of the FD providing insufficient cashflows.

579. Ofwat considers the impact of recent high inflation on the RCV and midnight adjustments to the RCV ahead of the PR24 makes the gearing reduction achievable for the notional company. This is in error.

580. Ofwat has previously encouraged companies to invest the gains from high inflation on the RCV in totex[231]. The only way companies can do that is to maintain their current level of gearing against the higher RCV which allows them to raise additional debt to finance new totex. This is completely at odds with Ofwat's current position that the gains from high inflation should be used to reduce gearing.

581. In practice, companies have maintained stable gearing while overspending on totex over AMP7. This suggests companies may have used the gains from inflation in the way that Ofwat previously encouraged.

582. Ofwat also overlooks that a third of the notional company's borrowings are index linked. This means that the notional company's borrowings move with inflation in the same way as its RCV albeit to a lesser degree. Thus, notional gearing is less sensitive to inflation than Ofwat suggests.

583. In practice, companies have a significantly higher share of index linked debt than a third and so their gearing is more stable than that of the notional company. The sector average share of index linked debt is 54.7%[232].

584. The reliance on midnight adjustments from previous price controls is inconsistent with the longstanding regulatory position that each price control is set on a standalone basis. In consequence, the impact of midnight adjustments are not relevant for the calibration of notional gearing for AMP8.

Proposed remedy

585. Ofwat has, for the reasons outlined above, incorrectly reduced notional gearing from 60% in the CMA PR19 Redetermination to 55%. We request that the CMA redetermines notional gearing as 60%.

[230] KPMG, March 2025, Estimating the Cost of Capital for PR24, para 7.2.2, SOC-7-0034.
[231] Ofwat, June 2023, IN 23/04 Guidance on factors Ofwat considers in assessing dividends declared or paid, page 6, SOC-7-0082.
[232] Median of WaSCs and large WoCs (i.e. excludes PRT, SSC and SES) as at 31 March 2024 based on Ofwat's MFR 2024. SVE and HDD were combined into SVT.

4 Ofwat's allowed return on equity fails market tests

4.1.1 Introduction

586. It is important to test Ofwat's allowed return against the market requirement for return in the real world. Ofwat's allowed return after aiming up in the FD was 5.10%.

587. If the allowed return is below the market requirement, it means there are market opportunities that offer higher risk-adjusted returns than the water sector. A rational investor would choose to put their capital in these opportunities over water equity. The consequence is that the water sector may struggle to attract new equity. This is particularly important for AMP8 as the sector needs to attract significant new equity.

588. We have applied a series of market tests to the allowed return to determine whether it meets the market requirement. The market tests we apply relate to the same factors that inform aiming up in section 3.3.1:

- Risk-reflective vs other asset classes;
- Risk reflective vs other sectors;
- Market evidence; and
- Debt financeability.

589. We have not included parameter-level cross-checks or fair bet as in aiming up. Parameter-level cross-checks cannot in isolation inform whether the allowed return does not meet the market requirement. We have assumed that investors in the notional company face symmetric equity returns and so a fair bet.

590. The market tests are applied based on a 55% gearing to ensure consistency with the allowed return.

4.1.2 Assessment of Ofwat's allowed return on equity against market tests

Risk-reflective vs other asset classes

- Return on investment grade bonds – The allowed return provides only a small equity risk premium above low/no risk debt such as NGs and investment grade bonds, including those issued by companies which it considers have 'outstanding' business plans. The equity risk premium, based on the spread between its allowed return and cost of new debt, has fallen to the lowest level since at least PR04;
- Inference analysis – Inference analysis infers the cost of equity for water stocks from their cost of debt. The inferred cost of equity is 1.40-1.63% above the allowed return; and
- Hybrid bonds – Hybrid bonds infers the cost of equity for water stocks based on the cost of hybrid bonds issued by regulated utilities. The inferred cost of equity is 0.70-3.30% above the allowed return.

591. This indicates the allowed return does not contain a sufficient equity risk premium over the cost of debt to incentivise rational investors to commit higher-risk equity capital rather than debt capital to the sector. Put differently, the investment case for water debt is more attractive than water equity.

592. Moody's has recognised the same: *"Based on the proposed parameters, the cost of equity allowance provides a slightly better buffer to the cost of new debt allowance than the early view estimate. However it still indicates a rather low equity premium to attract new funding in a higher interest rate environment"* [233].

Risk-reflective vs other sectors

- Infrastructure fund equity IRRs – Ofgem at RIIO-2 cross-checked its CAPM cost of equity using equity IRRs for infrastructure funds. The cross-check assumes that infrastructure funds are of comparable risk to regulated utilities and therefore should have comparable returns. The average equity IRR for infrastructure funds implies a cost of equity that is 2.92-4.01% above the allowed return; and
- Ofgem RIIO-3 allowed return – Ofgem includes SVT/UUW in the comparator set for the RIIO-3 SSMD beta which means it views water companies as comparably risky to energy companies. Since Ofgem set its RIIO-3 SSMD, clear market evidence has emerged that investors perceive water as riskier than energy. It follows that the allowed return in energy should be a floor for that in water. Ofgem's RIIO-3 SSMD allowed return at 55% gearing is 0.09-0.64% above the PR24 allowed return.

593. In this context, independent rating agencies and equity analysts have recently commented that water is perceived as riskier than energy by investors:

- S&P – *"We consider the water sector riskier than electricity transmission networks, owing to a deterioration in public and political perception and weaker financial resilience across the sector, exemplified by the ongoing financial stress facing Thames Water, the largest company in the sector"* [234];
- Moody's – *"The lower cost of equity allowance for water companies* [relative to regulated energy] *implies that the overall risk should be lower in the water sector. However, the water companies in England and Wales face heightened public and political attention, and tougher performance incentives may prevent them from achieving the allowed returns"* [235]*;* and
- Barclays – *"Ofwat sees water as a lower-risk asset than other regulated assets. We do not see evidence of this, nor do investors"* [236].

594. This indicates that there is a low incentive for rational investors to commit capital to the water sector because there are higher returns available in other sectors for comparable, if not lower, risk.

Market evidence

595. Equity analyst estimates – There are a few investment banks, such as Barclays and JP Morgan, that regularly publish a house view of the required cost of equity for UK Water. The allowed return is below these equity analyst estimates which means it could underestimate investors' required return:

- Barclays – *"The FD came in fully in line with our expectations… However, this still lies below our 'required' returns of 6.1% real RORE and 4.42% real WACC"* [237]; and

[233] Moody's, August 2024, Ofwat's draft determination increases sector risk, page 7, SOC-7-0009.
[234] S&P, February 2025, U.K. Water Regulatory Framework Support, Low Financial Flexibility In Coming Regulatory Period Drive Rating Actions, page 9, SOC-1-0013.
[235] Moody's, August 2024, Ofwat's draft determination increases sector risk, page 8, SOC-7-0009.
[236] Barclays, August 2024, Breaking the water cycle – no longer so positive, page 64, SOC-7-0049.
[237] Barclays, December 2024, Increasing certainty should re-rate sector, page 10, SOC-7-0048.

- JP Morgan – *"…core infrastructure in general should provide a real equity return of 5-7%, with Ofwat's final CoE allowance just scraping into this range"* [238].

596. MAR – Ofwat's MAR analysis in the FD shows a MAR-implied cost of equity of 3.56-7.22%.

597. The allowed return is 0.29% below the midpoint of the MAR-implied cost of equity and so the actual cost of equity required by investors under its interpretation of the MAR. It is not logical or consistent that Ofwat has set its allowed return below the cost of equity implied by its own (and only) cross-check.

598. Ofwat's MAR analysis is based on all listed water companies. The allowed return is below the range of the MAR-implied cost of equity for PNN (5.22-7.22%). PNN is a closer proxy for the notional company than SVT/UUW as explained in section 3.2.4. This suggests the allowed return is below that for the notional company.

599. KPMG has updated Ofwat's MAR analysis to a data cut-off date of January 2025 which shows a MAR-implied cost of equity of 4-7.70%[239]. This means the gap between the midpoint of Ofwat's cross-check and its allowed return has widened to 0.75% since the FD. The observation against the MAR-implied cost for equity for PNN continues to hold (5.70-7.70%).

Debt financeability

600. There is a higher hurdle for achieving debt financeability at AMP8 than at AMP7. This is because Moody's increased its rating thresholds by half a notch in response to Ofwat's DD. S&P increased its rating thresholds by a full notch and Fitch by between half to a full notch in response to Ofwat's FD.

601. Ofwat's intention for reducing the notional gearing from 60% to 55% is to improve the notional company's financial resilience. As the intention is for financial resilience, we have assessed what cost of equity a notional company with our specific characteristics requires to maintain a Baa2/BBB with 2% RoRE underperformance under the FD. Our assessment shows that the notional company requires a cost of equity[240] of 5.8% for Moody's and 6.3% for Fitch[241] on the basis of metrics alone[242].

602. It is also important to consider equity financeability for the notional company as a cross-check for the allowed return. Ofwat uses UUW and SVT as proxies for the notional company for setting the beta.

603. UUW and SVT have both accepted Ofwat's FD and released investor presentations in relation to their acceptance. SVT does not comment on its target gearing range for AMP8 in its investor presentation. UUW comments that it is currently geared at 60% and has a target gearing range for AMP8 of 55-65%[243].

[238] J.P. Morgan, December 2024, A rising tide lifts all ships, pages 3-4, SOC-7-0083.
[239] KPMG, March 2025, Estimating the Cost of Capital for PR24, table 37, SOC-7-0034.
[240] This is the wholesale cost of equity and the assessment assumes there is no risk asymmetry.
[241] Issuer default rating.
[242] See Chapter 1: Risk and financeability for further detail.
[243] United Utilities, January 2025, PR24 Final Determination investor presentation, pages 8-9, SOC-7-0084.

604. It follows that UUW's gearing may increase from 60% to 65% over AMP8 and in any case remain above Ofwat's notional gearing of 55%. This means that UUW is relying less on equity capital and more on debt capital than Ofwat assumes under the notional structure.

605. One interpretation of this is that UUW does not consider it viable to raise the level of equity capital that Ofwat assumes under the notional structure at the allowed return. As Ofwat uses UUW as proxy for the notional company, this means the notional company may not be equity financeable at the allowed return.

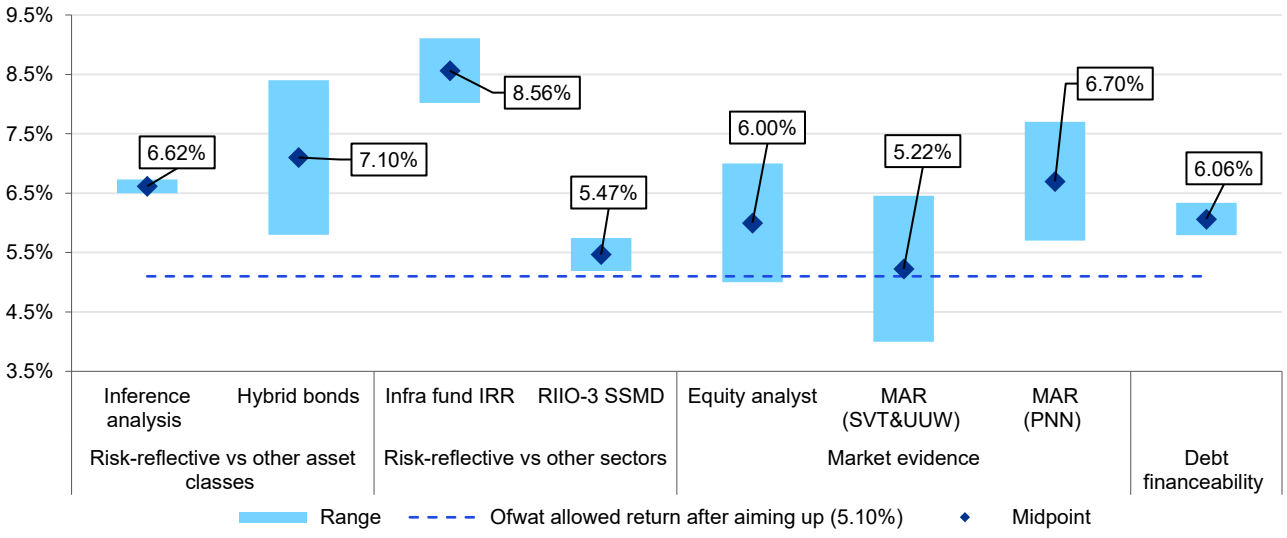
606. We consider that PNN is also a relevant proxy for the notional company for setting the beta. Ofwat does not use PNN to set the beta but includes PNN in its MAR analysis. This means that it views PNN data as relevant for setting the allowed return for the notional company.

607. PNN has accepted Ofwat's FD and launched a £490m rights issue to support its capital programme for AMP8. This rights issue was executed at a discount of 6% of RCV[244]. This reaffirms that the notional company cannot raise equity at the allowed return and is therefore not equity financeable.

4.1.3 Conclusion

608. The chart below compares Ofwat's allowed return after aiming up to our market tests. The chart shows that the allowed return fails our market tests as it sits below the range of every market test.

Figure 20: Ofwat allowed return after aiming up vs market tests (CPIH-real, 55% gearing, excl. RMA)



Source: Southern Water analysis based on KPMG and Frontier Economics reports[245]

609. The consequence of Ofwat setting an allowed return that fails our market tests is that there is a low incentive for investors to allocate new capital to water equity. This means the allowed return is not financeable.

[244] Based on Southern Water analysis.
[245] Southern Water, March 2025, WACC Data book, worksheet "C_Figure 20", SOC-7-0001.

610. Ofwat has a finance duty to secure that water companies are able (in particular, by securing reasonable returns on their capital) to finance the proper carrying out of their functions. As the allowed return is not financeable, Ofwat has not met its finance duty.

611. The government recently placed a new growth duty on Ofwat. The government's statutory guidance for the growth duty asserts that investment in high quality infrastructure is a vital driver of economic growth. It states that regulators can support investment in infrastructure by removing regulatory barriers. We regard the allowed return as one such regulatory barrier if it is not financeable. Thus, Ofwat has not met its growth duty.

5 Required return

612. The table below sets out (1) Ofwat's allowed return; (2) our view of the industry WACC; and (3) our view of the industry WACC plus Southern Water-specific positions.

613. Our view of the industry WACC applies to the sector average company. Our Southern Water-specific positions are grounded in the notional framework; they apply to a notional company with our specific characteristics. We have two Southern Water-specific positions which are:

- 75:75 industry-wide sharing factor applied to the ex-ante estimate of our actual cost of embedded debt; and
- The RCV growth rate implied by our mandated capital programme in our share of new debt.

614. Ofwat's allowed return is 3.97% and our view of the industry WACC for the sector average company is 4.98%. Our Southern Water-specific positions increases this to 5.15% for a notional company with our characteristics.

615. Our estimate the WACC for a notional company with our characteristics is financeable. In particular, our cost of equity passes the market tests set out in section 3.3 and cost of debt provides for efficient debt costs.

Table 12: Required WACC after aiming up (CPIH-real)

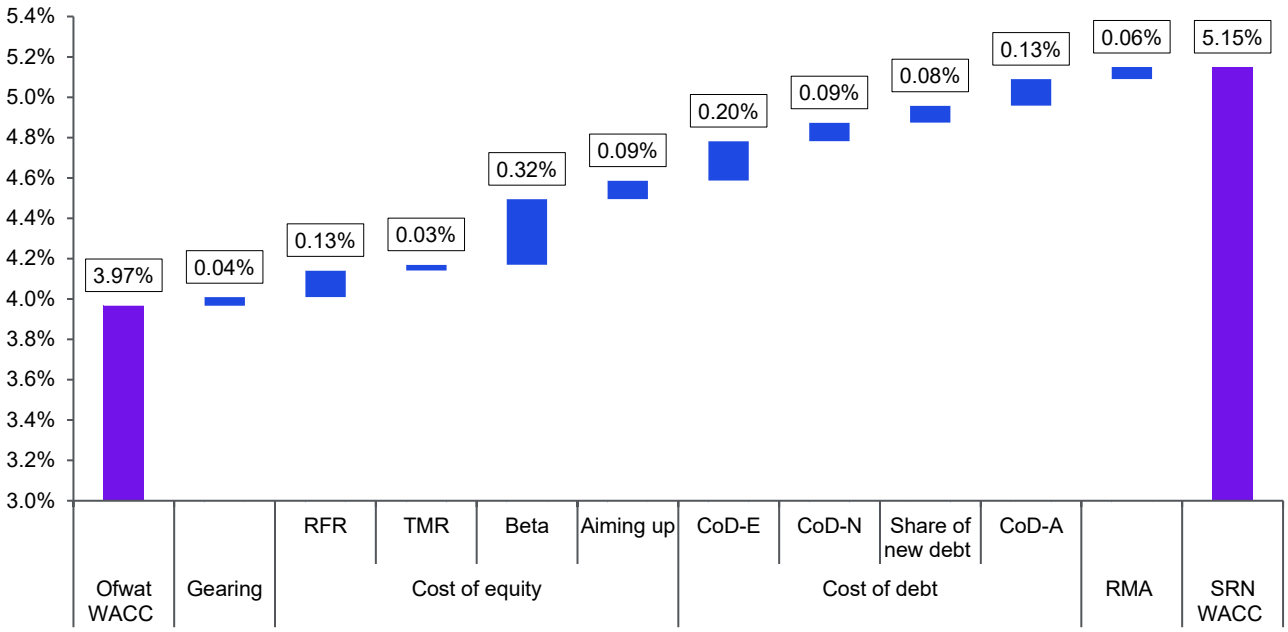
Parameter	Ofwat FD	Our view of industry WACC	Our view of industry WACC plus Southern Water-specific positions
Data cut-off date	**September 2024**	**January 2025**	**January 2025**
Notional gearing	55%	60%	60%
RFR	1.52%	2.59%	2.59%
TMR	6.83%	6.93%	6.93%
Asset beta	0.34	0.41	0.41
Debt beta	0.10	0.10	0.10
Notional equity beta	0.62	0.88	0.88
Estimate before aiming up	4.83%	6.39%	6.39%
Aiming up	0.27%	0.50%	0.50%
Cost of equity	**5.10%**	**6.89%**	**6.89%**
CoD_E	2.77%	2.94%	3.20%
CoD_N	3.74%	4.37%	4.37%
Share of new debt	24%	28%	36%
CoD_A – basis risk	0.00%	0.06%	0.06%
CoD_A – cost of carry	0.07%	0.22%	0.22%
CoD_A – liquidity cost	0.03%	0.04%	0.04%
CoD_A – issuance cost	0.05%	0.05%	0.05%
Cost of debt	**3.15%**	**3.71%**	**3.99%**
WACC, appointee	**4.03%**	**4.98%**	**5.15%**
RMA	-0.06%	0.00%	0.00%
WACC, wholesale	**3.97%**	**4.98%**	**5.15%**

Notes: Southern Water-specific positions are shaded in grey
Source: Southern Water analysis[246]

616. The chart below bridges between Ofwat's allowed return and our estimate of the WACC. The gap between Ofwat's allowed return and our estimate of the WACC is c.£596m (nominal) in total over AMP8.

[246] Southern Water, March 2025, WACC Data book worksheet "C_Table 12", SOC-7-0001.

Figure 21: Ofwat's allowed return vs Southern Water's estimate of the WACC (CPIH-real)



Source: Southern Water analysis[247]

617. Our risk analysis shows that a notional company with our specific characteristics is subject to downside asymmetric risk of 0.52%.

618. This downside asymmetric risk should be compensated through an asymmetric risk premium of 0.52% on top of our estimate of the cost of equity (or 0.21% on top of our estimate of the WACC). This amounts to an additional c.£100m (nominal) in total over AMP8.

6 Required remedy

619. We request the CMA to replace Ofwat's erroneous allowed return with our estimate of the WACC.

620. Setting the allowed return appropriately is critical for securing new investment. Investors will only allocate capital to companies if the allowed return appropriately compensates them for the risks involved.

621. Setting the allowed return appropriately falls under Ofwat's finance duty. Ofwat has a finance duty to secure that companies are able (in particular, by securing reasonable returns on their capital) to finance the proper carrying out of their functions. The finance duty, like Ofwat's other duties, is fundamentally in the interest of customers. The CMA must make its determination in accordance with Ofwat's finance and other duties.

The sector needs to invest significantly to ensure a resilient service for customers

622. Ofwat has impeded the flow of investment into the sector in favour of lower bills in previous AMPs. This has not been in the long-term interest of customers as now asset resilience is weakened and service levels have not improved as expected. This can only be resolved at AMP8 through an

[247] Southern Water, March 2025, WACC Data book worksheet "C_Figure 21", SOC-7-0001.

unprecedented level of investment. The allowed return must be set appropriately to secure this investment.

623. Ofwat's approach of favouring bills over investment has eroded investor confidence to all-time low. It is in the customer interest to rebuild investor confidence as the water sector relies on investors to finance its capital programme. The allowed return must be set appropriately to win back investor confidence.

624. The government also has a strong interest in the successful delivery of the capital programme for AMP8. The capital programme has been designed to meet the government's environmental policy. It is also important to the government's agenda of promoting sustainable economic growth.

625. In this respect, the government recently placed a new growth duty on Ofwat. The government's statutory guidance for the growth duty asserts that investment in high quality infrastructure is a vital driver of economic growth. It states that regulators can support investment in infrastructure by removing regulatory barriers. We regard the allowed return as one such regulatory barrier if it is set inappropriately low.

626. Our estimate of the WACC provides a financeable return to investors.

The changes in the sector since PR19 underscore the need for a financeable allowed return

627. The have been two important changes in the sector since PR19 in terms of risk.

628. First, the quantity of risk has increased. Investors in the sector face materially higher risk at AMP8 than in previous AMPs. This is because *inter alia* companies face a step-change in delivery and performance risk. Second, the price of risk has increased. The price of infrastructure capital is higher at AMP8 than in previous AMPs. This is because the competition for capital across infrastructure sectors worldwide has intensified.

629. These changes reinforce the need for a financeable allowance for AMP8 and mean such an allowance would be above that set in previous AMPs. To this end, the methodologies developed for previous AMPs should be adapted to ensure a financeable allowance is set for AMP8.

630. A financeable allowance will need to take account of the changes in risk on downside asymmetry and debt financeability. Investors will not allocate new capital where the price control is not a fair bet or where the company cannot achieve and maintain a strong investment grade rating.

631. Our estimate of the WACC fully reflects the changes in risk in the sector since PR19.

Our company-specific issues underscore the need for an appropriate allowed return

632. Our shareholders have invested heavily and are in the process of making a new £900m equity investment. This reflects their commitment to our turnaround and ultimately our customers. It cannot be expected that shareholders continue to make unbounded investments at an inappropriate allowed return.

633. Our capital programme for AMP8 is larger and more complex than for other companies. This is essential to provide our customers with a resilient water service. However, it means that our plan for AMP8 is risker than for other companies which increases our need for an appropriate allowed return.

634. We are in turnaround and have made significant progress. It is imperative that AMP8 provides a platform for this to continue. An inappropriately low allowed return could undo our significant progress and weaken our ability to achieve a successful turnaround at the pace we want and our customers expect.

The consequences for customers of setting an unfinanceable allowed return are too high

635. An unfinanceable allowed return would lead to outcomes that are harmful to customers and investors.

636. In the short-term, it could jeopardise the water sector's ability to attract the investment required to deliver the capital programme for AMP8. Deferral of the capital programme could undermine levels of infrastructure resilience and service in the water sector. In the long-term, it will increase the required return for investors as the risk that the allowed return does not equal the required return will have crystallised.

637. The CMA recognised the same at PR19: *"…expectations of insufficient investment returns based on the current cost of capital may discourage companies from identifying and proposing otherwise desirable investment projects. If overall water asset health deteriorates as a result, this may lead to higher required investment (and so higher investor returns) in future periods. In this way, the current cost of capital can have a direct impact on the level of future investment and the future costs to customers"* [248].

638. Our estimate of the WACC protects customers against these harmful outcomes.

[248] CMA, March 2021, Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations - Final report, para 9.1273, SOC-7-0023.

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Chapter 8
Our Conclusion

1. Our conclusion

1. The PR24 period is the most complex, busiest and arguably most important AMP in the recent history of Southern Water. We need to complete our Turnaround, which has seen continued shareholder support and management focus on improving the outcomes for our customers. We also need to reverse the recent history of regulatory underfunding and invest significantly in our environment to meet new statutory targets and our customers' expectations.

2. We have not taken the decision to seek a redetermination of Ofwat's PR24 final determination lightly. We see a large number of errors in this FD and this SoC reflects the high degree of concern that we have with the overall settlement – not least the significant imbalance of risk reflected in the FD.

3. In this final chapter, we address:

- **Positive impact from our SoC remedies and remaining risk:** We conclude with a reassessment of the likely risk outcome should the CMA adopt each of the remedies suggested in this SoC; as well as the suggested treatment for the remaining risk; and

- **Limiting the impact on customer bills:** We want the final word in the SoC to focus on bills. The unprecedented increase in environmental regulatory requirements and the resulting generational increase in the level of investment in AMP8 will place an additional burden on customers' bills. We therefore ask the CMA to limit the impact of this SoC on our customers.

4. In Annex 8 (Post-remedy PR24 Calculations: Financeability and Retail Allowances), we outline a series of calculations which we would ask the CMA to take into account, when forming its final PR24 settlement. These include Ofwat errors, which the regulator has already agreed to change, the retail price, which changes to reflect wholesale bills and finally, cash flow levers, such as PAYG rates and the RCV-run off to ensure that the settlement is financeable.

1.1. Positive impact from our SoC remedies and remaining risk

5. As detailed the preceding chapters, Ofwat has made a number of errors in its FD that require remedies from the CMA. This section seeks to reassess our risk allocation post-application of these remedies, to understand the impact on the RoRE assessment of these individual mitigations. We also model the remaining asymmetric risk after the each of the remedies in its SoC have been applied, and ask the CMA to adopt an additional aiming-up on the WACC return.

6. In this SoC, we have asked the CMA to implement the following remedies:

- **Risk, financeability:** Overall mitigation of the imbalance of risk and return, achieved through the other remedies in the SoC. We also propose the following specific remedies against the risk mechanisms:
  - Removal of the OAM deadband;
  - Updated ASM thresholds to support financeability such that the lower thresholds sum to ±200bps and an upper threshold including totex that sums to ±300bps; and
  - Totex ASM to be separated between water and wastewater price controls similar to the Outcomes ASM.

- **Botex:** Meeting our funding requirements, as described through correcting Ofwat's modelling errors, allowing our CACs, correcting the frontier shift and the energy RPE and implementing a gated process enabling an additional allowance reflecting our asset health needs;

- **Enhancements:** Enhancement totex cost gap gaps closed, including the £304m on WRMP supply-demand balance;

- **Uncertainty mechanisms:** Appropriate allocation of enhancement schemes to regulatory mechanisms;

- **PCDs:** Non-delivery PCDs disapplied where we have started work and intend to deliver in full. Time-incentive PCDs disapplied for in-AMP rewards and penalties, but retained for late penalties for delivery in the next AMP. PCDs removed from botex projects; and

- **PCs/ODIs:** Mitigation of individual excessive downward skew.

7. We have updated our RoRE risk analysis, after the application of the remedies from this SoC are applied to the FD. The resulting risk ranges are materially more balanced with return.

Table 1: Risk ranges presented before and after applying requested remedies

	FD: Our risk analysis for a notional company like SWS				Post-remedies: Our risk analysis for a notional company like SWS			
	Mean	**P10**	**P50**	**P90**	**Mean**	**P10**	**P50**	**P90**
Totex	-2.62%	-3.74%	-2.60%	-1.50%	-0.27%	-1.37%	-0.37%	1.19%
Retail	-0.20%	-1.21%	-0.20%	0.78%	-0.20%	-1.21%	-0.20%	0.78%
ODIs + MeXes	-0.49%	-1.56%	-0.50%	0.57%	-0.14%	-0.83%	-0.16%	0.56%
Financing	-0.39%	-2.33%	-0.38%	1.53%	0.01%	-2.39%	-0.01%	2.41%
Revenue & Other	-0.04%	-0.08%	-0.03%	0.00%	-0.04%	-0.08%	-0.03%	0.00%
RoRE (simulated)	**-3.74%**	**-6.41%**	**-3.75%**	**-1.12%**	**-0.50%**	**-3.51%**	**-0.52%**	**2.57%**

Source: Our risk analysis.

8. While the remedies that we suggest have a positive effect on both the downside skew at the P50 position and also the P10/P90 positions, some residual asymmetric risk in the P50 remains negative. We have sought to work within the confines of Ofwat's regulatory framework. However, residual skew in the outcomes incentive package and non-deliver PCD risks at the P50 level are likely to still deliver a negative result for the notional company like Southern. This means that investors would still be unable to expect to earn the required return, in spite of the actions of management and significant improvements in performance.

9. In Chapter 7, we outlined our remedies for matching the WACC to the market expectations for returns in light of the inherent level of risk in the water sector following Ofwat's FD. While we identified the imbalance between risk and return, and the majority of the SoC has a positive effect on rebalancing most of the asymmetric risk, we ask the CMA to complete the task and to set a WACC with an aiming up adjustment to account for a risk premium on top of the cost of equity to reflect the residual asymmetric risk.

10. The CMA in PR19 provided a risk premium for asymmetric risk through the aiming-up adjustment. In Chapter 7, we asked the CMA to apply a risk premium on top of the notional company cost of equity of 0.52% (or 0.21% on the WACC) to reflect the remaining asymmetric risk for a notional company like Southern Water.

1.2. Limiting the impact on customer bills

11. The unprecedented increase in environmental regulatory requirements and the resulting generational increase in the level of investment in AMP8, will have a significantly positive effect on our customers and our environment in which they live. However, we recognise that this will place an extra burden on our customers' bills, particularly in the first year of the AMP. Further, we recognise that certain of the remedies sought in this SoC will add to the increase in bills.

12. We ask the CMA to help to limit the impact on customer bills. In this section, we outline the following two actions through which the CMA could take regulatory action to mitigate the impact of bill increases:

- **Delaying more of the increase in bills:** We would like to see more of the increase in bills delayed into future periods, where the financeability of the company allows; and
- **Focusing ODI penalties on those who need the most help:** Our current Social Tariff, which is designed to help those customers least likely to be able to afford an increase in bills, affords relevant customers a discount on future bills ranging from 45% to 90%. However, where there are ODI penalties, these act as a discount for all customers. Given the unprecedented increase in investment in AMP8, we asked Ofwat to re-allocate ODI penalties to our Social Tariff, but Ofwat did not change its regulation to accommodate this. We now ask the CMA to act.

1.2.1. Delaying more of the increase in bills

13. We recognise that an increase in investment will have a financial impact on our customers. However, we and our regulators should do what we can to limit the impact of bill increases. While this SoC seeks remedies which will appropriately fund investment and limit risk to enable the company to finance and fulfil the environmental investment that will benefit our customers, we ask the CMA to make final changes to its PR24 settlement to reduce the impact on bills.

14. The AMP8 programme reflects a catch-up in investment that has largely been supressed by regulation over the last generation. This is placing the burden on our current customers. While it is in our customers' interests to invest in a cleaner environment, the benefits will be felt by our current and future customers. Therefore where possible, delaying more of the burden of this investment into the future would be appropriate.

15. In this SoC, we have discussed the financeability of the notional company. It is important that we are able to finance the investment needed to fulfil our environmental regulatory requirements. Many of the FD's errors negatively impact the financeability of the company, and we ask the CMA to remedy these areas. If the CMA chooses to adopt these remedies, it is possible that the constraints on the notional company could ease.

16. This is where we ask the CMA to take action. In its final calculations of its PR24 settlement, we ask the CMA to delay the recovery of revenue into future periods, where the financeability of the notional company allows. This would have the effect of limiting the bill increases in the short term, borne by our customers.

1.2.2. Focusing ODI penalties on those who need the most help

17. While the CMA can take action to limit the bill increase to all of our customers, we are particularly concerned about those customers who need the most help. We ask the CMA to take an innovative step to increase the support for these customers.

18. Since 2020, we have experienced an unprecedented global pandemic which dramatically changed how we live and work. We have also seen a sustained cost of living crisis, been partially driven by the longer-term impacts of the pandemic and the economic impacts of the war in Ukraine.

19. We responded to the ongoing cost of living crisis by reviewing the level of financial support we provide for our customers. We recognised our basic Social Tariff discount of 20% was no longer sufficient, so increased this to 45% in October 2022. We transferred all existing Social Tariff customers receiving the basic discount to this higher level, meaning they would benefit without having to take any action.

20. Our current package of financial support is made up of discount schemes, payment plans and a hardship fund. We have two main discounts: Essentials (our Social Tariff), which now gives customers a discount on future bills from 45% to 90%, and WaterSure, an industry-wide tariff that caps bills at the average household bill.

21. We also introduced a hardship fund we can use to help customers in several ways. We can use it to pay up to 50% of a customer's bills for up to a year if they are in temporary financial difficulty. We can also write off up to £2,000 of a customer's debt if they have managed to get back on track with their bills but will not be able to pay off their arrears. We can also use hardship money to buy a domestic appliance for someone who cannot afford to replace an item that has broken down or for food vouchers.

22. In our PR24 business plan, we asked Ofwat to increase the level of support offered to our most vulnerable customers by re-distributing penalties from ODIs. Currently, under Ofwat's framework, ODI penalties, where they are generated, act to reduce all of our customers' bills. However, given the unique size of the increase in investment in AMP8, we believe that there is an opportunity to alter this policy and its policy that constrains the allocation of funds to customer support, to focus any penalties to further reduce the bills for those customers who are eligible for the Social Tariff.

23. In our business plan, we asked Ofwat to use £20m of AMP7 2020 to 2025 ODI penalties to support our most vulnerable customers. We asked Ofwat to allows us to use £15 million of ODI penalties incurred for our performance between 2020 and 2025 to support an additional 24,000 customers on our Social Tariff. This means we would have been able to support 182,000 customers in total through our Social Tariff.

24. Further, we also wanted to increase the number of customers supported through our Hardship Fund, as this targets those most in need. We proposed to use a further £5 million of performance related ODI penalties to increase the Hardship Fund to £1.25 million per year, compared to the

current £250,000 a year, across all five years.

25. We were disappointed that Ofwat chose not to adopt this suggested change in policy. On 10th December 2024 we received a letter from Ofwat with the following response:

> *"We note in particular that underperformance penalties are due to both household and non-household customers, while the Government guidance specifically requires that any such funding should come from household customers. However, if you were to return penalties to non-household customers only, you would then be at risk of breaching licence condition E, which requires you to not set charges that result in undue discrimination (in this case between household and non household customers).*
>
> *You will appreciate that we cannot endorse an approach that in order to be implemented requires you either to have non households cross-subsidise social tariffs for household customers or to breach your licence."*

26. We recognise that there are barriers in the current system that would make an increase in support to our most vulnerable customers difficult to implement. However, we ask the CMA to work through the complications to allow a common-sense approach, and set a policy that permits additional support for our most vulnerable customers through re-distributing future ODI penalties. We want to work with the CMA to develop how this policy could be applied.

Annex 1
Glossary

Term	Explanation
AAD	Advanced Anaerobic Digestion. Advanced method for treating wastewater treatment sludge anaerobically using thermal hydroylsis (also used to generate energy/gas from sewage sludge treatment).
Abstraction	The process of taking water from a source, such as a river or lake, for use by a water company.
Adjusted R-Squared	Adjusted R-squared, a modified version of R-squared, adds precision and reliability by considering the impact of additional independent variables that tend to skew the results of R-squared measurements.
Affordability	The ability of customers to pay their water bill.
AICR	Adjusted Interest Coverage Ratio. The AICR measures the scope to make interest payments after meeting costs that have been expensed and RCV run-off. AICR is a more conservative measure than the unadjusted interest cover and provides an indication of coverage assuming companies could not reduce RCV run-off. This is a key financial ratio for the assessment of financeability.
Aiming-up	An adjustment appied to the midpoint of the CAPM-implied range for the cost of equity to arrive at the point estimate for the cost of equity.
Allowed return	The rate of return that a water company is allowed to earn on its RCV. The allowed return on capital is applied to the RCV to provide a revenue allowance for efficient financing costs. It is set in real (CPIH) terms, with respect to the notional capital structure.
ALM	Andover Link Main - a new pipeline to connect new water resources to our customers in the Andover area.
AMP	Asset Management Period, a five-year period in which water companies are required to invest in their infrastructure and deliver improvements to their services.
AMP7	Asset Management Period 7: April 2020 to March 2025
AMP8	Asset Management Period 8: April 2025 to March 2030
AMP9	Asset Management Period 9: April 2030 to March 2035
AONB	Area of Outstanding Natural Beauty, a designated area of countryside in the UK that is protected for its natural beauty and landscape.
APH	Average Pumping Head. APH is a calculation of the amount of work a company does to pump water (volumes and lifts) to meet its operations.
APR	Annual Performance Report. A report produced annually to confirm the performance of the company.
ARD	Allowed Revenue Direction, the legal instrument by which a DPC appointee can collect revenue associated with DPC from its customers

Term	Explanation
ASHE	Annual Survey of Hours and Earnings. The Annual Survey of Hours and Earnings (ASHE), carried out in April each year, is the most comprehensive source of information on the structure and distribution of earnings in the UK.
ASM	Aggregate Sharing Mechanism. A mechanism that reduces the financial impact of very high or very low performance beyond certain thresholds on customers and companies.
Asymmetric risk	A situation where the potential for downside risk is greater than the potential for upside risk.
Base-case	The most likely scenario for a company's performance, based on historical data and current trends.
BAT	Best Available Techniques
Bathing waters	Designated areas of water in the UK that are regularly tested for bacteria levels and are open to the public for swimming and other recreational activities.
BAU	Business as Usual
Benchmarking	The process of comparing a company's performance to the performance of other companies in the same sector.
Beta	A measure of a company's exposure to systematic risk relative to the wider market.
Bioresources	Bioresources refers to wastewater sludge transport, treatment, recycling and disposal.
Bioresources IED	Bioresources Industrial Emissions Directive
Blind year	The last year of a price control period.
B-Mex	Business Customer Experience Ofwat common performance commitment
BOD5	Biochemical Oxygen Demand
BoE	Bank of England
Botex	Base total expenditure
BP	Business Plan
Bps	Basis points. A basis point is one hundreth of a percentage point. It is commonly used as a unit to describe differences in the yield of financial instruments.
BR-Mex	Business Customer and Retailer measure of experience Ofwat common performance commitment

Term	Explanation
CAA	Civil Aviation Authority
CAC	Cost Adjustment Claim
CAD	Conventional Anaerobic Digestion, Advanced method for treating wastewater treatment sludge anaerobically (also used to generate energy/gas from sewage sludge treatment).
CAF	Cyber Assessment Framework
CAM	Cost Adjustment Mechanism
CAM2	A second Cost Adjustment Mechanism
CAP	Competitively Appointed Provider
CAPA	Competitively Appointed Provider Agreement
CAPM	Capital Asset Pricing Model. The CAPM is the standard model for estimating the cost of equity.
Caps and Collars	Caps and collars are the limits on outperformance and underperformance payments for each PC, respectively.
Catch-up challenge	Efficiency savings required by the least efficient companies in the sector to catch-up to the most efficient companies.
CBA	Cost Benefit Analysis
CEO	Chief Executive Officer
CHP	Combined Heat and Power, this concurrent production of electicity or mechanical power with useful thermal energy.
CICS	Common Incident Classification Scheme, a system used by the Environment Agency to classify pollution incidents.
CIT	Cost Intelligence Team, provides cost models that allow historical and forecasted analysis of cost trends.
Clawback	A mechanism by which a regulator can reclaim funds from a water company if it fails to meet its performance or delivery targets.
CMA	Competition and Markets Authority
C-Mex	Customer measure of experience Ofwat common performance commitment
CoDA	Additional Borrowing Costs. The cost of raising debt and maintaining liquidity.
CoDE	Cost of Embedded Debt. The cost of servicing existing debt capital for a company.

Term	Explanation
CoDN	Cost of New Debt. The cost of raising new debt capital for a company.
CoE	Cost of Equity. The cost of attracting and retaining equity capital for a company.
Common performance commitment	Performance commitments that all companies must have.
Cost of debt	The cost of raising and servicing debt capital for a company.
CPIH	Consumer Prices Index including owner occupiers' housing costs, a measure of inflation in the UK.
Credit rating	A measure of a company's creditworthiness, based on its financial performance and risk profile.
CRI	Compliance Risk Index, a measure of a water company's compliance with its regulatory obligations (Ofwat common performance commitment).
CW20	Ofwat business plan data table reference
CY	Convenience Yield. This reflects the special properties of government bonds which depress their yields below the risk-free rate
DBFOM	Design, Build, Finance, Operate and Maintain
DD	Draft Determination, a document published by Ofwat setting out its proposed draft regulatory framework and draft charges for the next AMP.
DDCM	Delayed Delivery Cashflow Mechanism, a mechanism by which a regulator can return allowances to customers if a water company is materially underspending in the first two or three years of the AMP.
DDM	Dividend Discount Model. DDM is a quantitative method used for predicting the price of a company's shares based on the theory that its present-day price is worth the sum of all of its future dividend payments when discounted back to their present value.
DDR	Draft Determination Response, Southern Water's response to the Ofwat Draft Determination.
Deadband	A range of performance around a performance commitment level where a water company will not receive a financial penalty or reward.
Debt financeability	The ability of a company to raise debt capital to fund its investment programme.
Deep Dive	Ofwat's assessement of the quality of evidence provided by water companies in their investment cases.
DEFRA	Department for Environment, Food and Rural Affairs. Defra is the UK government department responsible for improving and protecting the

Term	Explanation
	environment. It aims to grow a green economy and sustain thriving rural communities in England
DM	Delivery mechanism by which Ofwat will release funding once a water company has demonstrated that it can deliver the schemes.
DESNZ	Department for Energy Security and Net Zero
DMA	District Metered Area - a local area wthiin the water distribution network
D-Mex	Common performance commitment designed to improve outcomes for developer services customers in England and Wales
DMS	DMS database (Dimson, Marsh, and Staunton) provides annual returns on stocks, bonds, bills, inflation and currencies for 35 markets
Downside risk	The potential for a company to underperform its expected performance.
DPC	Direct procurement for customers is an alternative approach, through competitive tendering, for water companies to deliver large scale, discrete programmes of work by means of a third party, which potentially may include the design, construction, financing, ownership, operation and maintenance of an asset.
DWI	Drinking Water Inspectorate. The DWI is the independent regulator of drinking water supplies in England and Wales, ensuring that water companies supply safe drinking water that is acceptable to customers and meets the standards set down in law. The DWI also ensure the resilient delivery of wholesome and sufficient drinking water.
DWMP	Drainage and Wastewater Management Plan
EA	The Environment Agency, established in 1996 has responsibilities to the protection and enhancement of the environment in England.
EDM	Event Duration Monitoring. Monitors that are often used at the end of pipes to detect when there is flow occurring.
EECS	Enhanced Engagement and Cost Sharing, a mechanism by which a regulator can reduce the risk borne by a water company for over- and under-spending on enhancement totex.
EIA	Environment Impact Assessment
EiP	Environment Improvement Plan 2023 for England
EPR	Environmental Permitting Regulations
FD	Final Determination, a document published by Ofwat setting out its final regulatory framework and charges for AMP8.

Term	Explanation
FEO	Final Enforcement Order, an order which stipulates steps a company must do or must not do by a specified date, to achieve compliance with the requirements enforceable under section 18 of the Water Industry Act 1991
FFO / net debt	Funds from Operations. Funds from operations measures companies' debt burden in relation to operational income. This is a key financial ratio for the assessment of financeability. It is also a key ratio for rating agencies, although each rating agency may make specific adjustments to FFO and/or net debt for its calculations
Final Methodology	Ofwat's PR24 final methodology for the 2024 price review
FIS	Flood Incident Standards
FOAK	First-of-a-kind, a scheme that is new and innovative and has not been implemented before.
Frontier Shift	Productivity improvements (for example in technology or ways of working) expected by Ofwat to shift the efficiency frontier for the sector.
FRS 102	Financial Reporting Standard applicable in the UK and Republic of Ireland
GAC	Granular Activated Carbon
Gated scheme	A scheme where a water company is only allowed to spend a certain amount of its allowance in the first year of the AMP, and the remaining allowance is released over time as the scheme progresses.
Gated allowance	An expenditure or contingent allowance provided to the company, where the company needs to pass through a series of gates to access additional funding. This allows additional scrutiny of the investment.
GDP	Gross Domestic Product
Gearing	Gearing measures the percentage of a company's regulatory capital value that is financed by debt and is therefore critical to the assessment of financeability. This is also a key financial ratio for rating agencies, although each rating agency may have its own definition of net debt.
GFCF	Gross Fixed Capital Formation, value of fixed assets
GHG	Greenhouse Gas
GIIA	Global Infrastructure Investors Association
Glidepath	A gradual reduction in the rate of an outcome delivery incentive over time.
GLS	Generalised Least Squares, this is a method in statistics to estimate the unknown parameters in a linear regression model.

Term	Explanation
GSS	Guaranteed Standard Scheme, when a company fails to meet minium standards of services it is required to make a specified payment to the customer affected under the Guaranteed Standards Scheme.
GVA	Gross Value Added, value of goods and services
HDD	Ofwat acronym for Hafren Dyfrdwy
HDPE	High-Density Polyethylene. Type of material used for some water and sewer pipes.
Headroom	The difference between a company's current credit rating and the minimum credit rating required by its regulator.
HMT	His Majesty's Treasury
IAP	Independent Appointed Party, a project finance entity that is responsible for delivering a strategic infrastructure project.
iBoxx indices	A benchmark index for corporate bonds. Bond indices compiled by IHS Markit and commonly used as a regulatory benchmark for the cost of debt
ICA	Instrumentation, Control and Automation - assets that support remote monitoring and control of our assetss
IDR	Issuer-default rating
IED	Industrial Emissions Directive
ILG	Index Linked Gilt. Index linked bond issued by the UK government.
Index-linked debt	Debt that is linked to an inflation index, such as RPI or CPIH.
Inflation	A general increase in prices over time.
Interest cover	Interest cover measures the ability to meet interest payments from operational sources of cash generation.
Investability	The ability of a company to attract investment, taking into account both debt and equity financeability.
IRRs	Internal Rate of Return. The discount rate at which the net present value of an investment's cashflows equal zero.
KPMG	KPMG is a global management consulting company that engage in a number of businesses including audit, accounting, advisory, technology, transformation etc.
LAD	Local Authority District, a local government area in the UK.
Leakage	The loss of water from a water company's network due to leaks in pipes. A common Ofwat performance commitment for water supply.

Term	Explanation
Leverage	The amount of debt that a company has relative to its equity.
LURA	Levelling Up and Regeneration Act, a UK government act that sets out requirements for environmental protection.
MAR	Market-to-Asset Ratio. The ratio of a regulated company's market value to its regulated capital value.
MC	Marginal Cost, change in the total cost that arises when the quantity of product/service is increased or quality of product/service is improved.
MCERTS	Monitoring Certification Scheme. Scheme for certifying monitoring equipment to confirm that it meets required industry standards once installed and operational.
MCZs	Marine Conservation Zones, designated areas of sea that are protected for their marine life.
MEICA	Mecahnical, Electrical, Instrumentation, Control and Automation
MeX	Performance commitments that measure the experience of residential customers (C-MeX), developer services customers (D-MeX), business customers in Wales and business customers in England (BR-MeX).
MFMs	Multifactor Models
Ml/d	Million Litres per Day, measure of water supply and abstraction.
Monte Carlo simulation	A statistical technique used to model the potential outcomes of a complex process, such as the performance of a water company.
MOSL	Market Operator of England's non-household water market
MPF	Market Performance Framework, MOSL's framework for assessing performance of the non-household water market.
MSOA	Middle Super Output Area, population density variable.
MZC	Mean Zonal Compliance - a measure of compliance with drinking water quality that Ofwat monitored performance against, prior to changing to Compliance Risk Index (CRI)
NE	Natural England is the government's adviser for the natural environment in England, who help to protect and restore our natural world.
NG	Nominal Gilt. Nominal fixed rate bond issued by the UK government.
NIS	Network Information Systems Regulations - The Security of Network & Information Systems Regulations (NIS Regulations) set the level of security (both cyber & physical resilience) of network and information systems for essential services.

Term	Explanation
Notional company	A hypothetical company that is used by a regulator to assess the impact of its regulatory framework on the sector.
Nominal bills	Nominal bills are bills that capture the impact of inflation or the amount prices rise year-onyear. Customers pay bills in nominal terms.
NPV	Net present value
N-removal	Nitrogen removal
NTAL	Nutrient Technical Achieveable Limit. The limits at which current technology will allow a company to get to in regards to nutrient reduction.
OAM	Outcome Adjustment Mechanism. A mechanism that adjusts the impact of outturn reconciliations for all companies equally in terms of the proportion of regulated equity to keep the reconciliation of the median average of companies within a range of -50bps to +50bps. The mechanism applies to common performance commitments.
OBR	Office for Budget Responsibility
ODI	Outcome delivery incentives are the financial consequences for companies associated with their performance commitments. Incentive payments are determined by multiplying a company's performance relative to its performance commitment level by an incentive rate.
Ofgem	Office of Gas and Electricity Markets
OFT	Office of Fair Trading
Ofwat	Water Services regulation Authority
OLS	Ordinary Least Squares. OLS is a statistical tool for fitting data to an equation.
ONS	Office for National Statistics
OPA	Overall Performance Assessment - Ofwat's framework for performance assessment prior to the PR14 totex and outcomes framework
Opex	Operating Expenditure
Oxera	Oxera is an independent economic consultancy
P10/50/90	These are terms used in risk distribution analysis. A p10 scenario represents a downside scenario where there is a one in ten chance of performance being worse than the level considered. Conversely a p90 scenario represents an upside scenario where there is a one in ten chance of performance being better than the level considered. p50 is the mid range scenario.

Term	Explanation
PAYG	Pay as you go. PAYG is the proportion of total allowed expenditure that is recovered in each year of the price review period. Along with RCV run-off, balances the recovery of costs between different generations of customers. A company's choice of PAYG and RCV run off rates affects bills for current and future customers.
PC	Performance commitments are the measures of performance that we hold companies to account for when delivering outcomes for customers and the environment.
PCC	Per Capita Consumption
PCDs	Price Control Deliverables. Price control deliverables are used to ensure that customers receive the performance and outputs they have funded through enhancement allowances.
PCL	Performance Commitment Level, a target that a water company is required to meet for a specific performance commitment
PE	Population Equivalent, the ratio of the sum of the pollution load in wastewater to the individual pollution load in household sewage produced by one person in the same time.
PFAS	Per- and Polyfluoroalkyl Substances, a group of synthetic organofluorine chemcial compounds commonly found in nonstick and stain resistant coatings.
PFF	Passed Forward Flow - the flow of wastewater sent to treatment rather than allowed to spill at the location of a storm overflow
PMICR	Post Maintenance Interest Cover Ratio, financial ratio used by rating agencies when determining credit ratings
PNN	Pennon Group
P-removal	Phosphorous removal
PR14	Price Review 14, the UK water sector price control period corresponding to AMP6, i.e. 2015-2020.
PR19	Price Review 19, the UK water sector price control period corresponding to AMP7, i.e. 2020-2025
PR24	Price Review 24, the current UK water sector price control period corresponding to AMP8, i.e. 2025-2030
PR29	Price Review 29, the future UK water sector price control period corresponding to AMP9, i.e. 2030-2035
PRT	Ofwat acronym for Portsmouth Water

Term	Explanation
P-Value	The probability that a particular statistical measure of an assumed probability distribution will be greater than or equal to (or less than or equal to in some instances) observed results.
R&D	Research and Development
RAG	Regualtory Accounting Guidelines
RCV	Regulatory Capital Value, the value of a water company's assets that are subject to regulation. It reflects the allowed expenditure to be recovered from future customers. Expenditure not recovered in the current period through PAYG is added to the RCV and recovered in future periods through RCV runoff. The RCV is inflated each year to maintain the RCV at current prices.
RCV Run-Off	RCV run-off is a measure of the annual depreciation of the RCV to reflect the longterm nature of the benefit to customers of the previous investment a company has made in its assets. Along with PAYG, the RCV run-off balances the recovery of costs between different generations of customers. The choice of PAYG and RCV run-off rates affects bills for current and future customers.
Real bills	Real bills are bills which do not reflect the impact of inflation or the amount that prices rise year-on-year. They are measured in the prices of an initial or base year.
Retail margins	The retail margin is an allowed return which funds risk and financing costs associated with our retail controls. A gross margin is a mark-up over wholesale costs, while a net margin is a mark-up over wholesale costs plus cost-to serve. We cap the level of margin charged at the level of the overall control, however the underlying margins faced by different customer groups may vary.
Repex	Replacement Expenditure, Ofgem's separate allowances for opex, capex and replacement expenditures
Regulatory equity	Regulatory equity is the regulatory capital value less net debt.
RFR	Risk-Free Rate. The rate of return on an investment with zero risk.
RGF	Rapid Gravity Filtration, a water treatment process used in the purification of water by removing suspended solids.
RIIO	Revenue, Incentives, Innovation and Outputs, a regulatory framework used by Ofgem for the UK energy sector.
RIIO-ED2	Second RIIO price control review for Electricity Distribution
RIIO-GD2	Second RIIO price control review for Gas Distribution
RMA	Retail Margin Adjustment

Term	Explanation
R-Mex	Retailer Experience Survey. Ofwat commom performance commitment for customer experience.
RNAG	Reasons for Not Achieving Good, a set of criteria used by the Environment Agency to assess the ecological status of water bodies.
RoRE	Return on Regulated Equity, a measure of a water company's profitability. Return to shareholders as a proportion of the equity component of RCV calculated by reference to the notional capital structure.
RPE	Real Price Effects, a mechanism by which a regulator can adjust the allowances for a water company to reflect changes in the cost of inputs, such as labour or energy.
RPI	Retail Price Index. Measure of inflation based on using retail prices.
R-Squared	R-squared is a statistical measure that indicates how much of the variation of a dependent variable is explained by an independent variable in a regression model
S&P	Standard and Poor's. S&P is a credit-ratings agency.
SEMD	Security and Emergency Measures (Water and Sewerage Undertakers) Direction 1998 – commonly referred to as SEMD. This is what sets the outcomes water companies must meet to protect national security and mitigate the effects of any civil emergency.
SES	Ofwat acronym for SES Water (Sutton and East Surrey Water) - Water company that is part of the Pennon Group.
SEW	Ofwat acronym for South East Water
SIC	Standard Industrial Classification, classifying industries by a four-digit code as a method of standardising industry classification
SIM	Service Incentive Mechanism
SIPR	Specified Infrastructure Project Regulations, secondary legislation made under the Water Industry Act 1991 making provision for a delivery mechanism for large schemes that extend beyond a single AMP.
SLM	Southampton Link Main - a new pipeline to connect new water resources to our customers in the Southampton area.
SOAP	Storm Overflow Action Plan, a plan set out by a water company to reduce the frequency of spills from storm overflows in its region.
SOC	Standard Occupational Classification, system is used to classify workers by their occupations. Jobs are classified by their skill level and content.
SoC	Statement of Case

Term	Explanation
SODRP	Storm Overflow Discharge Reduction Plan, a plan set out by DEFRA to reduce the number of storm overflows.
SPAs	Special Protection Areas, designated areas of land or sea that are protected for their birds.
SREP	Strategic Resilience Enhancement Programme
SRN	Ofwat acronym for Southern Water
SRO	Strategic Resource Option
SSMD	Ofgems Sector Specific Methodology Decision
SSO	Settled Storm Overflow - a storm overflow from a tank that allows settling of solids to reduce the pollutant load
SSSI	Site of Special Scientific Interest
Statistical Significance	Statistical significance is a determination that a relationship between two or more variables is caused by something other than chance
STC	Sludge Treatment Centre
STW	Sewage Treatment Works (also known as wastewater treatment works)
SuDs	Sustainable Drainage Systems
SVT	Ofwat acronym for Severn Trent Water
Symmetric risk	A situation where the potential for downside risk is equal to the potential for upside risk.
TAL	Technically Achievable Limits
TDS	Tonne of Dried solid Sludge
TFP	Total Factor Productivity. The ratio of aggregate output to aggregate inputs, used as a measure of economic efficiency. Also known as “multi-factor productivity”.
THP	Thermo Hydrolysis Plant, using heat and high pressure sewage sludge is broken down, resulting in quick decompression in anaerabc digestion
Time-incentive	A mechanism by which a regulator can reward or penalise a water company for the timeliness of its delivery of a scheme.
TMR	Total Market Return. The total return on the market portfolio over a given period of time.
TMS	Ofwat acronym for Thames Water

Term	Explanation
Totex	Total expenditure, the total cost of a water company's investment programme.
Triangulation	A method which seeks to triangulate across a set of models with different cost drivers and levels of cost aggregation to mitigate the risk of error and bias in any one model
True-up	A mechanism by which a regulator can adjust the allowances for a water company to reflect changes in the cost of inputs, such as labour or energy. It is a payment made post-closing to adjust for any difference between the purchase price, which was determined on a transaction's closing date and based on estimated financial metrics, and the actual purchase price determined using financial metrics that become known only after the closing date.
TWD	Treated Water Distribution. The network of pipes and fittings used to distribute treated clean water to customers.
UK	United Kingdom
UKCSI	UK Customer Service Index
UKWIR	UK Water Industry Research
Underperformance	A situation where a company fails to meet its expected performance.
Upside	The potential for a company to outperform its expected performance.
UUW	Ofwat acronym for United Utilities
UWWTR	Urban Wastewater Treatment Regulations
VfM	Value for Money
Vulnerability	A vulnerable customer is one who, due to personal characteristics, their overall life situation or due to broader market and economic factors, is not having reasonable opportunity to access and receive an inclusive service which may have a detrimental impact on their health, wellbeing or finances.
WACC	Weighted Average Cost of Capital, a measure of a company's cost of capital, taking into account the cost of debt and the cost of equity. The WACC is calculated as the cost of equity multiplied by the percentage of equity assumed for the notional company plus the cost of debt multiplied by the percentage of debt assumed for the notional company. It represents the allowed return for the providers of equity and debt finance.
WAFU	Water Available for Use
WaSC	Water and Sewerage Company

Term	Explanation
Water Resources	Water Resources price control. Costs in this price control include the maintenance, operation and enhancement of water resources costs; mainly focused on raw water assets and distribution or raw water to treatment.
WATS	Weighted Average Treatment Size
WCP	Water Company Performance Report. A report on company performance.
WFD	Water Framework Directive, a European Union directive that sets out requirements for the protection of water bodies.
Wholesale totex	The total cost of a water company's investment programme, excluding retail costs.
WIA	Water Industry Act 1991
WINEP	Water Industry National Environment Programme, a programme of actions that water companies are required to take to meet their statutory obligations and regulatory expectations. Sets out the requirements expected of companies to meet their environmental outcomes in England
WNP (or WN+)	Water Network Plus price control. Costs in this price control include the maintenance, operation and enhancement of raw water treatment and distrubition of treated water to customers taps.
WoC	Water Only Company
WPS	Wastewater Pumping Station
WRMP	Water Resources Management Plan, a plan set out by a water company to manage its water resources over the long term.
WRMP19	Water Resources Management Plan published in 2019
WRMP24	Water Resources Management Plan published in 2024
WSI	upply Interruption, an event where a water company is unable to supply water to its customers. A Ofwat common performance commitment.
WSR	Water Service reservoir - a storage tank to balance flows of drinking water to customers
WSW	upply Works
WTP	Willingness to Pay. Measure of how much customers are willing to pay for service improvement.
WTW	Wastewater Treatment Works
WW	Wastewater

Term	Explanation
WWNP (or WWN+)	Wastewater Network Plus price control. Costs in this price control include the maintenance, operation and enhancement of wastewater treatment and sewerage networks.
Yield	The return that an investor expects to earn on a debt invesment.
YKY	Ofwat acronym for Yorkshire Water

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Annex 2
Ofwat's General Duties

1. Duties – the legal framework for the redetermination

1. This section summarises the statutory duties imposed on Ofwat that it was required to act in accordance with in making the Final Determination.

2. The CMA has previously confirmed in the PR19 Final Report[1] and in its detailed review of the relevant legal framework in its Bristol Water redetermination at PR14[2] that on a redetermination of an Ofwat price control:

   - In accordance with section 12(3)(b) WIA91, the CMA must decide the matter on its own merits in accordance with the statutory duties that apply to Ofwat, i.e. on a redetermination, the CMA is subject to the same duties as Ofwat in making the original price control determination;
   - The CMA will, when conducting a redetermination, exercise its own regulatory discretion as to how to appropriately balance these statutory duties;
   - A reference by Ofwat for a redetermination "is a reference for the determination of a new price control … not an appeal on specific elements of Ofwat's decision". The CMA therefore has the ability to consider any aspects of the referred price control and is able to decide afresh the issues and areas that it takes into consideration.

3. In this regard, the CMA has previously decided to "*adopt a proportionate approach*", and "*to scrutinise most closely the areas in the determination that would have the largest effect on customer prices and [the relevant water company]".*

4. As the CMA is making a fresh determination, the CMA should as a matter of principle consider any further issues that have arisen since Ofwat made the determination that is the subject of the redetermination; and

5. The CMA will have regard to previous decisions of the CMA and the Competition Commission (CC) to the extent relevant, bearing in mind that previous decisions will not have taken account of updates to the legislation (e.g. the new growth objective described below) or the current version of the SPS, and will have applied the duties in different circumstances

6. Southern Water has sought to reflect this approach in its Statement of Case, by focussing on identifying those areas of PR24 in which it considers that Ofwat has failed to act in accordance with its statutory duties, with particularly significant consequences for Southern Water's customers; and by drawing the CMA's attention to relevant new information to which the CMA is invited to have regard in carrying out this redetermination.

   In this annex, we discuss:

   - Primary duties;
   - Secondary duties;
   - Growth duty;
   - Principles of best regulatory practice;
   - Strategic policy statement; and
   - Water (Special Measures) Act 2025;

[1] PR19 Final Report, paras 2.82 – 2.83 and 2.85
[2] Bristol Water PR14 Final Report, para 18

Primary Duties

7. Section 2(2A) WIA91 sets out Ofwat's primary duties. Under Section 2(2A)WIA91 (supplemented by Section 2(2C) Ofwat (and by extension, the CMA on a redetermination) must exercise and perform its powers and duties under the WIA in the manner which it considers is best calculated to:

- Further the consumer objective, which is to protect the interests of consumers, wherever appropriate, by promoting effective competition (the Consumer Objective);
- Secure that the functions of a water undertaker and of a sewerage undertaker are properly carried out in respect of every area of England and Wales (the Functions Duty);
- Secure that companies holding appointments under Chapter 1 of Part 2 of this Act as relevant undertakers are able (in particular, by securing reasonable returns on their capital) to finance the proper carrying out of those functions (the Financing Duty);
- Secure that water or sewerage licensees properly carry out their activities and any statutory functions imposed on them in consequence of the licence; and
- Further the resilience objective (the Resilience Objective).

8. The Resilience Objective is defined in Section 2(2DA) WIA91 as: (i) to secure the long-term resilience of water undertakers' supply systems and sewerage undertakers' sewerage systems as regards environmental pressures, population growth and changes in consumer behaviour; and (ii) to secure that undertakers take steps for the purpose of enabling them to meet, in the long term, the need for the supply of water and the provision of sewerage services to consumers, including by promoting: (a) appropriate long-term planning and investment by relevant undertakers, and (b) the taking by them of a range of measures to manage water resources in sustainable ways, and to increase efficiency in the use of water and reduce demand for water so as to reduce pressure on water resources.

9. Ofwat (and the CMA) must consider these primary duties in the round, rather than considering each duty on a standalone basis. The CMA made clear in its Bristol Water decision in PR14 that "*we considered that we were required to apply each of the general duties in accordance with its statutory wording, taking the whole of section 2 into account, and not to apply individual duties (whether principal or secondary duties) in isolation*" and "*in our view, these various principal duties were intended to complement, not conflict with, each other, and the principal duties should each be given equal weight*." The CMA reaffirmed this position in its PR19 Final Report.[3]

Secondary Duties

10. WIA91 also sets out a series of secondary duties. Under Section 2(3) WIA91, Ofwat (and by extension, the CMA on a redetermination) is required to carry out its primary duties in a manner which it considers is best calculated to:

- Promote economy and efficiency on the part of companies holding appointments under Chapter 1 of Part 2 of this Act as relevant undertakers in the carrying out of their functions;
- Secure that there is no undue preference or discrimination by such companies;
- Secure that consumers' interests are protected where such companies sell land or interests/rights in or over land;
- Ensure that consumers are protected as regards any unregulated activities of such companies; and

[3] PR19 Final Report, para 2.84.

- Contribute to the achievement of sustainable development (the Sustainability Duty).

11. As set out above, the CMA has been clear that individual secondary duties must also not be applied in insolation[4], and that they are "subordinate to, or subject to, the primary duties but are still legal requirements that must be taken account of"[5].

Growth duty

12. Ofwat has since 2024 also been subject to a growth duty. Pursuant to Section 108 of the Deregulation Act 2015, when performing its regulatory functions, Ofwat must have regard to the desirability of promoting economic growth.[6] In particular, Ofwat must consider the importance for the promotion of economic growth of exercising the function in a way that ensures that (i) regulatory action is only taken where it is needed; and (ii) any action taken is proportionate.

Principles of best regulatory practice

13. In carrying out its duties, Ofwat is also obliged by Section 2(4) WIA91 to have regard to the principles of best regulatory practice, including the principles under which regulatory activities should be transparent, accountable, proportionate, consistent and targeted only at cases in which action is needed, in exercising its powers and functions.

Strategic Policy Statement

14. The Secretary of State may from time to time publish a statement setting out strategic priorities and objectives for Ofwat in carrying out relevant functions relating wholly or mainly to England (the Strategic Policy Statement or "SPS"). Pursuant to Section 2A of WIA91, Ofwat must carry out its functions in accordance with the strategic policy statement.

15. The current version of the SPS was published in February 2022.[7] In this version, the UK Government sets out the following strategic priorities for Ofwat:

- **Protect and enhance the environment:** Ofwat should, working with other regulators and government, challenge water companies to improve their day-to-day environmental performance to enhance the quality of the water environment. Ofwat should also drive water companies to be more ambitious in taking action to protect and enhance the environment, in particular by taking appropriate action to improve water quality;
- **Deliver a resilient water sector:** Ofwat should challenge the water industry to plan, invest in, and operate its water and wastewater services to secure the needs of current and future customers, in a way which delivers value to customers, the environment and wider society over the long-term;
- **Serve and protect customers:** Ofwat should push water companies to provide a better and fairer water service for all, by improving customer services and complaints handling. Ofwat should challenge water companies to meet the needs of vulnerable customers, including those who are 'transiently' vulnerable; and
- **Use markets to deliver for customers:** Ofwat should, where appropriate, consider how promoting competition in markets can drive long-term sustainable investment, providing benefits to customers and supporting government's priorities. Ofwat should focus its efforts on the business retail market, the NAV market, ecosystem services, developer connections, major infrastructure provision, and bioresources.

[4] See para 1.1.2 above.
[5] PR19 Final Report, para 2.84 and Bristol Water PR14 Determination, paragraph 3.4.
[6] The Economic Growth (Regulatory Functions) (Amendment) Order 2024 amends Schedule 1 of The Economic Growth (Regulatory Functions) Order 2017 to list Ofwat as a regulator to which section 108 of the Deregulation Act 2015 now applies.
[7] February 2022: The Government's strategic priorities for Ofwat, updated 28 March 2022, Link

16. The CMA confirmed in its PR19 Final Report that there should not be a conflict between the SPS and the primary and secondary duties taking into account that: (i) the SPS does not require extra weight to be given to one statutory duty over another; (ii) Ofwat's statutory duty is to carry out its functions in accordance with the SPS and to that extent it may prioritise certain work areas over others, but this does not affect the weight given to each primary duty; and (iii) the expectation is that the regulated water industry will reflect the priorities and objectives in its strategic direction.[8]

Water (Special Measures) Act 2025

17. The Water (Special Measures) Act 2025 was enacted on 24 February 2025 and extends to England and Wales. Pursuant to section 10, it imposes a new duty on Ofwat when exercising or performing relevant functions, to have regard to the need to contribute towards achieving compliance by the Secretary of State with relevant environmental target duties in:

- Section 1 of the Climate Change Act 2008 (UK net zero emissions target); and
- In relation to appointment areas wholly or mainly in England, section 5 of the Environment Act 2021 (other environmental targets).

18. This duty will come into force on a date to be specified in regulations that have not yet been made.

19. The accompanying Government policy statement makes clear that "as with Ofwat's other duties, it will be for them as the independent regulator to determine the appropriate balance of duties and this will not take precedence over other duties"[9].

[8] PR19 Final Report, para 2.86
[9] Water (Special Measures) Act: policy statement - GOV.UK

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Annex 3
Areas of the Final Determination that are not in Dispute

1. Paragraph 35 of the CMA's initial letter dated 26 February 2025 requested that we clearly indicate which areas are not being challenged, with a short explanation of this.

- Whilst formally, due to the operation of our licence, we have rejected the FD in respect of our retail price control, we are not challenging any aspect of the retail price control. However, we do request that the CMA recalculates the bad debt element of our retail price control using Ofwat's models to reflect any changes which the CMA makes to our wholesale costs.
- We make no challenge to Ofwat's Quality and Ambition Assessment (QAA).
- As regards base costs, we are challenging the FD base allowance but in doing so are seeking an additional allowance of only £94m compared with Ofwat's modelled allowances (an uplift of only c.2.5%). Our challenge is targeted towards only 2 out of 22 variables in the modelling suite. (We are also seeking a small number of company-specific adjustments relating to: energy prices, cost adjustment claims, and an asset health gated allowance, together with an adjustment to the assumptions for frontier shift.)
- Similarly, whilst we are challenging the FD enhancement cost allowances, we make no challenge in relation to £3.96bn of the £4.58bn total enhancement allowance set out at the FD.
- As regards PCs and ODIs, our challenge is limited to those aspects of the PC and ODIs framework identified in Chapter 6 of this Statement of Case.

Annex 4
New Material Contained in our Statement of Case

1 New material

1. As requested by the CMA in Process Note 1 dated 5 March 2025, please find below a table which identifies 'new' material contained in our SoC (being information post-dating that available at the time Ofwat made its Final Determination of price controls for PR24).

Table: New material in our Statement of Case

Chapter impacted	Document and file name	Short explanation
Chapter 1: Risk & Financeability	SOC-1-0009 - Bank cuts interest rates and slashes growth forecast	New market financial data
Chapter 1: Risk & Financeability	SOC-1-0013 - U.K. Water Regulatory Framework Support, Low Financial Flexibility In Coming Regulatory Period Drive Rating Actions	New S&P ratings outlook (Feb-25)
Chapter 1: Risk & Financeability	SOC-1-0015 - Fitch Revises Osprey Acquisition's Outlook to Negative; Affirms Anglian Debt at 'A-'	New Fitch ratings outlook (Feb-25)
Chapter 2: Base Costs	SOC-2-0056 - Monetary Policy Report - February 2025	New market data
Chapter 2: Base Costs	SOC-2-0057 - Cost assessment and benchmarking	New Business plan published as part of Ofgem RIIO-3 process
Chapter 2: Base Costs	SOC-2-0058 - Cost Assessment and Benchmarking Approach (including RPEs & OE) RIIO-T3 Business Plan SP Energy Networks	New Business plan published as part of Ofgem RIIO-3 process
Chapter 2: Base Costs	SOC-2-0059 - NGT A12 - Cost assessment and benchmarking approach	New Business plan published as part of Ofgem RIIO-3 process
Chapter 2: Base Costs	SOC-2-0060 - RIIO-T3 Business Plan	New Business plan published as part of Ofgem RIIO-3 process
Chapter 2: Base Costs	SOC-2-0066 - Frontier shift at the PR24 redeterminations	Report on frontier shift takes account of latest market data
Chapter 2: Base Costs	SOC-2-0073 - Error 8 - Asset health	Updated information from Southern Water's Pioneer asset health modelling
Chapter 3: Enhancement (Cost assessment)	SOC-3-0016 - U_MON4 sites and costs	Document contains more granular cost data than Ofwat received.
Chapter 4: Treatment of Uncertainty Through Mechanisms	SOC-4-0032 - Email - Subject: "RE_ Ofwat_SRN - update on bespoke iDoK"	Ofwat engagement March-25
Chapter 5: Price Control Deliverables	SOC-5-0005 - Statistical bulletin - Vacancies and jobs in the UK	Statistics were published following the FD
Chapter 5: Price Control Deliverables	SOC-5-0009 - Gate three final decision for Hampshire Water Transfer and Water Recycling Project	Decision was issued following the FD
Chapter 5: Price Control Deliverables	SOC-5-0012 - Enforcement case into Thames Water's potential delays in	Decision was issued following the FD

Chapter impacted	Document and file name	Short explanation
	meeting key environmental protection programmes	
Chapter 7: Weighted Average Cost of Capital (WACC)	SRN SoC Main Document: Chapter 7	WACC chapter takes account of market data until January 2025
Chapter 7: Weighted Average Cost of Capital (WACC)	SOC-7-0041 - Fitch Affirms UUW's Senior Unsecured at 'A-'; Downgrades UU's Senior Unsecured to 'BBB+'	Fitch's rating action on United Utilities post-FD
Chapter 7: Weighted Average Cost of Capital (WACC)	SOC-7-0056 - Assessing the balance of evidence in PR24 FD CoE estimates	An assessment of the FD cost of equity based on evidence available at the time the FD was set
Chapter 7: Weighted Average Cost of Capital (WACC)	SOC-7-0061 - An Investigation of Multi-factor Asset Pricing Models in the UK	An updated version of an academic paper on multifactor models. The original version was submitted as part of the DD Response
Chapter 7: Weighted Average Cost of Capital (WACC)	SOC-7-0073 - SRN CoD Tool	Our estimate of our actual cost of embedded debt (excluding cash profiling) based on our current debt book and market data as at January 2025
Chapter 7: Weighted Average Cost of Capital (WACC)	SOC-7-0084 - PR24 Final Determination investor presentation	United Utilities' investor presentation following its acceptance of the FD

2. In populating this table, we have interpreted the CMA's request as relating to new data points (e.g. latest market data and additional cost data). We have not understood the CMA's request as requiring us to identify new or updated arguments, including where these have been made in respect of issues raised for the first time in the Final Determination.

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Annex 5
Risk and Financeability Appendix 1: Economic regulatory risk in the Final Determination

from Southern Water

1. Appendix 1: Economic regulatory risk in the FD

1. We accept that there should be appropriate economic regulation over water companies, which takes into account our implicit operational challenges and the environmental regulatory risk decided by our environmental regulators. In this section, we outline how economic regulatory risk is structured and allocation within the framework of Ofwat's FD. We consider:

    1. Totex**;**
    2. Price control deliverables;
    3. Outcome Delivery Incentives (**ODIs**) and Measures of Experience (**MeXes**);
    4. Financing;
    5. Market based delivery; and
    6. Risk mitigation mechanisms.

1.1 Totex

2. Ofwat assesses the efficient levels of totex required to deliver good service for customers and deliver the capital programme and provides the necessary funding to companies through cost allowances. These are broken between wholesale totex allowances, covering water and wastewater services, and retail totex allowances, covering customer service. Wholesale totex is further broken into base totex, the cost to run the business and deliver customers good service, and enhancement totex, the cost to deliver the capital programme. The allowances are set through a combination of econometric modelling and bespoke cost assessments to ensure customers are not overpaying and companies have enough funding to deliver the determination. Beyond the allowances, Ofwat also set a series of mechanisms to allocate the impact of under- and overspend. These are detailed below:

- **Cost sharing mechanism**: Deviations from the allowances for base and enhancement expenditure are shared with customers through the cost sharing mechanism. Most base and enhancement expenditures have a 50% and 40% cost sharing rate, respectively, representing the risk retained by the company. For example, a £100m overspend on an enhancement project would see the company bear £40m while customers would bear £60m.
- **Efficiency challenge**: The regulator applies an efficiency challenge to base costs to encourage companies to operate more efficiently and prevent them from overstating expenses, ensuring fair cost assessments.
- **Inflation indexation**: Wholesale totex allowances are provided on a real basis and companies receive ex post true ups for CPIH inflation each year. This removes a degree of inflation risk from companies. Retail allowances are provided on a nominal basis including a forecasted inflation, which may deviate from actual inflation.
- **Protection mechanisms**: Uncertainty mechanisms, contingent allowances (i.e. Large Gated Scheme) and RPE protect companies from unforeseen costs arising from future regulatory changes, and input price changes. Some examples of RPEs include energy, material and labour.
- **Retail Profit Margin**: Retail profit margin is applied to retail totex to ensure companies have scope to profit from the retail price control activities. The retail related return is not provided through the cost of capital and is instead explicitly allowed as a margin. The retail price control does not benefit from cost sharing and therefore companies are allocated the full risk

of under or overperformance, excluding labour cost inflation which is shared through an ex ante labour RPE. Therefore the retail profit margin is the primary risk mitigant to absorb overspend on the retail price control.

1.2 Price control deliverables (PCDs)

3. To supplement the incentives applied to the capital programme and some elements of base totex, Ofwat has more widely applied PCDs in AMP8. Fundamentally, customers should not have to pay for investments that are not delivered and companies should deliver these programmes on time. There are two types of PCDs to achieve these objectives:

   a) **Non-delivery PCDs** apply protections for customers against a water company failing to deliver a scheme for which the FD provided funding. The allowance associated with any units not delivered by the end of AMP8 is clawed back by the regulator. Companies are exposed to risk should they spend the allowance trying to deliver but fail to deliver the full scope, incurring clawbacks and overspend. Approximately 80% of the sector expenditure is covered by non-delivery PCDs.

   b) **Time-incentive PCDs** protect customers against late delivery of schemes to incentivise timely delivery of the agreed benefit. Delivery is assessed against annual interim milestones. A penalty for any units not delivered is paid at the value of the allowed return (3.97%) multiplied by the allowance to deliver the units. A reward for timely delivery is given at a rate of 1/3 the penalty amount. Approximately 50% of the sector expenditure is covered by time-incentive PCDs.

1.3 ODIs and MeXes

4. Our service to customers is measured and incentivised through the outcomes framework. Service is measured across wholesale water and wastewater performance through Performance Commitments (**PCs**) which have Outcome Delivery Incentives (**ODIs**) attached, while customer service is measured through Measures of Experiences (**MeXes**) and are all covered by the outcomes framework. The outcomes framework seeks to ensure customers receive continued service improvements across a range of measures. Customers should receive continued service improvements as these improvements are funded through base totex allowances and also rely on past capital delivery schemes to improve performance in the long-term. Some of the key elements of the ODIs and MeXes framework include:

   1. **Performance Commitment Levels (PCLs):** PC targets are set for companies, holding them accountable for performance on metrics like pollution incidents and water supply interruptions. These represent targets for performance across the prescribed ODIs. Most PCLs are set based on an explicit level of performance companies are expected to achieve, however MeXes are relative measures that seek to achieve improved performance relative to the rest of the sector or external benchmarks like the UK Customer Satisfaction Index (**UKCSI**).

   2. **Rewards and Penalties:** Companies are exposed to rewards or penalties where performance deviates from target levels. The quantum of the financial outcome is calculated using the relevant ODI rate. ODI rates set the £m reward/penalty for each unit of performance better or worse than the PCL. There are also enhanced rates available for significant degrees of improvement to further incentivise improvement for customer priority PCs. As an example, an ODI rate of £0.98m for total pollution incidents implies the company

will pay a £0.98m for every incident (standardised by 10,000km of sewage network) above the target PCL.

3. **Risk mitigation:** Risk associated with rewards and penalties is restricted by caps, collars, and deadbands. Caps and collars provide limits to the maximum reward and maximum penalty respectively. A company would not bear the financial exposure associated with performance outside these bounds and customers are protected against uneconomic levels of investment. For example, a collar of £17m (0.75% wastewater RoRE) on total pollution incidents implies that exceeding the PCL by more than 18 standardised incidents (£17m collar / £0.98m rate) will result in no further financial penalty beyond £17m. Caps and collars are set as a percentage RoRE basis. Deadbands provide a performance buffer around the PCL in which no financial penalty is applied. For example, a deadband of one serious pollution incident above the PCL of zero incidents implies a company will only incur a financial penalty should their performance be two or greater.

1.4 Financing

4. The FD provides companies with separate allowances for efficiently raising financing to deliver the capital programme and refinance existing debt for past delivery. Companies are provided specific allowances for both embedded debt and new debt. The key mechanisms to incentivise efficient financing costs include:

a) **Embedded debt:** Embedded costs are known and thus performance against allowance is predetermined. This risk is borne in full, and a company will underperform the allowance where its actual cost of embedded debt exceeds the allowance.

b) **New debt:** The cost of new debt is trued up after the AMP based on the average iBoxx A/BBB non-financial 10+ index value plus 30bps to protect companies against market movements in interest rates. The adjustment of 30bps reflects Ofwat's view that companies tend to underperform the iBoxx index. If companies are unable to perform within the adjusted iBoxx index value, then they will be exposed to the costs.

c) **RPI-CPIH Wedge:** The allowance is set in CPIH terms, and the FD assumes an RPI-CPIH wedge of 90bps. Companies are therefore exposed to the risk of movements in the wedge given most debt in the sector is either RPI-linked or CPI-linked. Companies bear this risk should it exceed the 90bps allowance on embedded debt.

1.5 Market based delivery

5. To address long-term uncertainty on very large schemes that span multiple AMPs, Ofwat has introduced and in some cases required the use of market based delivery. Market base delivery ensure efficient costs for these longer-term and much large projects are secured for the project's duration to eliminate uncertainty AMP to AMP. There are two primary mechanisms that achieve this:

a) **Direct Procurement for Customers (DPC):** The mechanism allocates risk to a project finance entity, the Competitively Appointed Provider (**CAP**). The CAP takes on some of the risk that the company would have carried if the scheme was delivered in-house as totex. Long-term certainty on revenue for the CAP is supported by the Allowed Revenue Directive (**ARD**), which is set independent of the price control period to match the life of the project.

b) **Specified Infrastructure Project Regulations (SIPR)** is similar to the DPC but provides further separation between the company and the project finance entity, the infrastructure provider (**IP**). For example, the IP has its own RCV.

6. Both types of delivery mechanisms can have a wide variety of risk allocation to a water company determined by negotiations with Ofwat, the project finance entity and other water companies involved. In KPMG's sector analysis, they identified several key areas where market based delivery schemes can negatively impact our risk allocation under certain circumstances.[1] These include (i) delays in the construction phase that result in statutory penalties for failing to comply with a regulatory requirement, (ii) impact on our credit rating should elements of the CAP or IAP be consolidated for ratings purposes, (iii) should the CAP or IAP default during the construction phase we may need to fund the retender process outside of our allowances, and (iv) during the operational phase the CAP or IAP may not operate in line with our expectations resulting in penalties on ODIs or statutory fines. In the risk analysis presented later in this chapter, we have modelled the impact of the retendering costs should a CAP or IAP default. The other risks are more dependent on the commercial and contractual agreements reached between the relevant parties and can only be assessed once these agreements have been finalised.

1.6 Risk mitigation mechanisms

7. The FD attempts to limit the overall financial risk to which a company is exposed through two mechanisms: Aggregate Sharing Mechanism (**ASM**) and Outcome Adjustment Mechanism (**OAM**). The purpose of these mechanisms is to reduce the range of possible financial outcomes.

8. The ASM applies separately for totex and ODIs and MeXes:

- Totex. The totex ASM applies additional sharing of over/under-spend with customers beyond the cost sharing mechanism. A company will share 50% of the financial impact post-cost sharing greater than ±2% RoRE.
- ODIs & MeXes The outcomes ASM applies a 50% and 90% sharing rate to the combined financial exposure across the ODIs & MeXes which is above ±3% and ±5% RoRE respectively.

9. OAM adjusts the combined outturn financial penalty/reward for ODIs and MeXes, post-ASM, using the financial outcome in RoRE terms for the median company in the sector. Where a median company's financial outcomes exceed the given ±0.50% RoRE deadband, the OAM will apply a positive or negative financial adjustment equal to the delta between the median company outcome and the deadband of ±0.50% to all companies in the sector. For example, if the median company financial outcome for ODIs and MeXes is -0.70% of RoRE, all companies will receive a financial uplift of +0.2% RoRE.

1.7 Impact of risk allocation on our forward looking risk

10. This section sets out how our operational risks described in Chapter 0: Introduction to Southern Water may influence our performance against the regulatory mechanisms in the FD described above and thus how this risk is allocated.

[1] KPMG, January 2025, PR24 Final Determinations – risk analysis for a notional company, page 58-59, SOC-1-0001.

1.8 Ecological characteristics of our region

11. Our exposure to ecologically sensitive areas makes achieving the PCLs set by the FD more difficult, especially when these are set on a common basis across the sector without due consideration of the impact that our protected environments have on our ability to achieve PCLs. We are therefore more likely to incur penalties for underperforming.

12. We are also potentially subject to duplicate penalties where, for example (i) we underperform the PCL and thus receive a financial penalty from Ofwat; and (ii) the EA takes enforcement action and issues fines as a result, including downgrading our Environmental Performance Assessment (**EPA**) rating. We do not dispute the importance of reducing pollution incidents to preserve the environment, however, duplicative penalties from different regulators risk being so financially onerous so as to reduce funds available for investment in improving performance.

13. The nature of these protected environments has also driven requirements and increased investment under our regulatory WINEP and WRMP programmes.

- The protected and sensitive areas in our region drive a larger WINEP, with increased scope to meet very stringent limits. Examples include our nitrogen and phosphorus programme and increased storm overflows programme.
- The supply imbalance we are addressing in our WRMP is driven by abstraction license decreases on protected environments like chalk streams.

1.9 Regulatory changes

14. Our large WINEP and WRMP programmes require significant investment and the completion of complex and novel schemes, especially compared to prior periods, because we need to meet more stringent environmental standards.

15. Whilst the investment costs are provided for by the FD, the levels of delivery and complexity required increase the risk of overspend and late delivery. Ofwat has also applied an efficiency challenge to these novel and more complex schemes which has contributed to our cost gap and resulted in errors made in the assessment of allowances (Chapter 3: Enhancement (Cost assessment). We are therefore left with residual risk of overspend through the cost sharing mechanism.

16. Non-delivery and time-incentive PCDs cover most of this investment and will mean that we risk clawbacks and late penalties for delays due to third parties, e.g. supply chain issues or labour shortages. These penalties will limit our ability to deliver for the customer and the environment (see Chapter 5: PCDs).

1.10 Evolving risks

17. Population growth increases the investment required in our region to meet the growing supply needs. The resultant increase in demand exacerbates the risks associated with regulatory changes, which challenge our use of existing water sources. Our AMP8 capital programme therefore has to facilitate new water sources, not only to replace many of our existing sources to meet current demand, but also to meet future demand. As a consequence, we are relying on complex and novel schemes like re-use and desalination to meet current and future demand.

18. Climate change increases the investment required in resilience of our water and wastewater network. The FD grants allowances for these investments, however the magnitude and complexity of the schemes increase our delivery risk.

19. ODI performance against PCLs is likely to be worse as the impact of climate change accelerates. More rainfall during winters risks worse performance across a range of wastewater ODIs as the network is unable to cope with higher volume of flows. Climate change may also mean more frequent and severe named storms. As exclusions for pollution incidents during these extreme events are no longer available, we are more likely to underperform the pollutions target in AMP8 and thus incur more severe penalties.

20. The new classification of critical national infrastructure and increased requirements on security have also driven up the size of the capital programme. This further adds to an already large capital programme. As this is a statutory requirement there could be additional fines and penalties for not delivering on time.

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Annex 6

Risk and Financeability Appendix 2: Evidence of Why Ofwat's Approach to Risk Analysis is Flawed

from Southern Water

1 Appendix 2: Ofwat's approach to risk analysis is flawed

1. An important part of testing a regulatory determination involves undertaking a robust risk analysis to assess and quantify the degree of risk allocated. The risk analysis is a critical analysis for calculating expected performance and quantifying the size of net penalties that is reasonable for a plausible downside scenario. The risk identified and subsequent allocation of that risk outlined in the prior section is the subject of the risk analysis. Ofwat undertook a risk analysis of the risk allocation resulting from its FD and used the results to conclude that risk was broadly balanced in the FD, however Ofwat's risk analysis was deeply flawed.

2. The errors in Ofwat's risk analysis stem from the regulator's approach to risk throughout PR24. Throughout PR24, Ofwat has undertaken a limited risk analysis that is not capable of testing the risk exposures and risk mitigations that the regulator has introduced. Ofwat's flawed risk methodology directly leads to their wrong conclusions that risk in the FD is balanced and manageable.

1.1 Ofwat's approach to risk at PR24

1.1.1 Flaws in Ofwat's PR24 Final Methodology

3. The first major document published by Ofwat as part of the PR24 process was the PR24 Final Methodology, which outlines, among other things, the regulator's approach to risk allocation. Ofwat stated in the PR24 Final Methodology "*We disagree that it is necessary to prescribe a link between RoRE risk analysis and base allowed returns*".[1] This is, however, a very critical link in order to be able to finance the company given the level of risks.

4. The PR24 Final Methodology included a significantly under-developed risk analysis, which presented a single risk range derived using an additive approach as seen in **Error! Reference s ource not found.** below. The PR24 Final Methodology ignored individual risk characteristics of companies and key components of the regulatory framework. The PR24 Final Methodology asked companies not to do complex Monte Carlo risk analyses, instead favouring an additive approach for simplicity, noting that the additive approach generally overestimates risk.[2]

[1] Ofwat, December 2022, PR24 Final Methodology – Appendix 10 Aligning risk and return, page 8, SOC-1-0007.
[2] Ofwat, December 2022, PR24 Final Methodology – Appendix 10 Aligning risk and return, page 13, SOC-1-0007.

Table 1: Risk ranges from Ofwat's PR24 Final Methodology

Component of risk	Reasonable downside (P10)	Reasonable upside (P90)
Quality and ambition assessment	-0.30%	0.30%
Totex costs	-1.00%	1.00%
Retail costs	-0.20%	0.30%
Outcome Delivery Incentives	-2.00%	2.00%
Financing	-0.65%	0.70%
Measures of Experience	-0.65%	0.50%
Revenue incentive mechanisms	-0.05%	0.00%
Total	-4.85%	4.80%

Source: PR24 Final Methodology Appendix 10 Risk and Return, page 11.

5. Companies submitted business plans in October 2023, which included RoRE risk analyses that broadly indicated that risk was materially higher than Ofwat's risk ranges outlined in the PR24 Final Methodology.

1.1.2 Additions and revisions in the Draft Determination

6. In response to the sector's submissions, the DD included bespoke risk ranges for each company with some variation and a slightly more advanced risk analysis. The DD ranges were more developed than the single range the sector included in the PR24 Final Methodology.

7. Whilst additional risk mitigating mechanisms were introduced in the DD, they were not sufficient. The limitations of these risk mitigations were a result of the simplistic risk analysis performed by Ofwat. This resulted in significantly downside-skewed risk exposure. Every company in the sector calculated its P50 return to be less than the allowed return.[3] Companies also clearly signalled that the risk allocation was not appropriate in their respective business plan submission.

8. The DD also introduced key risk mitigations to address the increasing level of risk in AMP8. These mechanisms are described below.

- **Two aggregate sharing mechanisms (ASM) covering wholesale totex and outcomes respectively**. Ofwat's combined ASM thresholds were set so that as much as ±500bps of risk could be realised before any benefit is conferred (±200bps of RoRE on wholesale totex and ±300bps of RoRE on outcomes for 50% sharing). Several companies identified that the thresholds for ASM were high and did not provide sufficient risk mitigation in the plausible downside scenario. Ofwat's response was "these [ASM thresholds] will maintain strong incentives for companies to improve services to customers as the whole of the real allowed return on equity is at risk in the event of material underperformance".[4] Ofwat therefore set these thresholds purposefully as it had made the policy decision to leave the entire allowed return at risk before triggering any risk protection from the combined ASM thresholds. The wholesale totex ASM also considered water and wastewater totex together while ODI and MeXes ASM considered them separately. This is not consistent and separating the price controls is generally a fairer approach when comparing WaSCs to WoCs.
- This stood in contrast to a combined totex and ODI mitigation framework such as a Return Adjustment Mechanism (RAMs) adopted by Ofgem at RIIO-2, which has a lower threshold of

[3] Ofwat, December 2024, PR24 final determinations: Aligning risk and return – appendix, page 6, SOC-1-0008.
[4] Ofwat, December 2024, PR24 final determinations: Aligning risk and return – appendix, page 14, SOC-1-0008.

±300bps for 50% sharing and at 400bps for 90% sharing. Ofwat provided no evidence of having tested the efficacy of the ASM to maintain AMP8 financeability, particularly for extreme up- or downsides which Ofgem's framework protects against.

- **Limited use of caps, collars and deadbands on ODIs with a heavier reliance on the ASM for ODIs and MeXes to limit risk instead**. In the DD, Ofwat preferred to rely more heavily on the ASM for protection on the ODIs instead of targeted adjustments using caps, collars and deadbands. Ofwat however retained caps and collars on new ODIs and asset health ODIs and retained a deadband on Compliance Risk Index (CRI).
- **Adjustment for energy inflation through an RPE**. This included both an ex ante energy adjustment to allowances and an ex post true up in the cost reconciliation mechanism at the end of the period. This was in response to the significant volatility in energy prices experienced in AMP7 following the Russian invasion of Ukraine and provides a significant degree of risk protection.
- **Enhanced cost sharing rates for enhancement totex**. The introduction of the enhanced engagement and cost sharing (EECS) and gated allowance. In recognition of the larger scale and complexity of the capital programme, Ofwat reduced risk borne by the companies relating to over- and under-spending allowances from 50% to 40% retained risk. The bioresources industrial Emissions Directive scheme had sharing rates at 25% retained risk. Ofwat also identified schemes for the EECS and gated allowances which both carry a reduced sharing rate of 25% retained risk. The effectiveness of lower cost sharing rates greatly reduced risk arising from enhancement totex.

1.1.3 Ofwat's approach in the FD

9. Ofwat made targeted changes to reduce risk in the FD based on the sectors DD Responses. Ofwat estimates that its efforts: "r*educed overall downside skew that companies may have perceived to the expected return on equity by c. 360 to 480 basis points*".[5]

10. The fact that Ofwat has tried to correct the balance of risk and return means that they recognised that their DD was mis-calibrated and agreed with the companies' representations on risk, at least to some degree.

11. The risk in the DD on ODIs and MeXes was addressed through a recalibration of the incentive package and the introduction of a new mechanism. Between the DD and FD, Ofwat launched two consultations: (i) on recalibration of incentives to reduce risk; and (ii) to introduce the Outturn Adjustment Mechanism (**OAM**). The OAM seeks to address median company outcomes risk. The recalibration reset some PCLs to reflect outturn performance, reduced ODI rates and introduced collars and deadbands more widely.

12. The risk in the DD on totex was addressed through increasing allowances. Ofwat also increased sector-wide base totex allowances by £5bn and enhancement totex allowances by £6bn in the FD compared to the DD.[6] This helped to address cost gaps identified by companies in the DD. Indeed, Ofwat awarded some companies more allowance on base totex than requested in their DD Response.

13. Alongside a reallocation of risk, Ofwat attempted to provide a more robust risk analysis, for example with the inclusion of Monte Carlo simulations for ODIs.

14. Ofwat undertook a more serious analysis on outcomes including a model review by Grant Thornton. However, Ofwat did not replicate the methodology or recommendations from Grant Thornton for costs or financing risk analysis.

[5] Ofwat, December 2024, PR24 final determinations: Aligning risk and return – appendix, page 18, SOC-1-0008.
[6] Ofwat, December 2024, PR24 final determinations: Aligning risk and return – appendix, page 8, SOC-1-0008.

15. Overall, Ofwat failed to identify errors in the FD, which led to an imbalance of risk and return that are detrimental to financeability. Ofwat's assessment of risk was flawed across different types of risk assessed under Ofwat's analysis.

1.1.4 Errors in Ofwat's risk analysis

16. Ofwat's risk analysis methodology produces unreliable estimates of the level of risk in likely scenarios in AMP8. The assessment of risk is not reflective of risks facing the sector due to the assumptions made by the regulator.

17. This section describes Ofwat's approach for modelling each component of risk and the associated flaws in more detail. We first present an overarching set of errors before turning to each key risk driver and the specific errors made.

18. The overarching errors that generally apply to all risks modelled include:

- **Inconsistent use of Monte Carlo simulation**: Ofwat simulated outcomes risk using a Monte Carlo analysis for outcomes risk only but used an additive method to quantify totex and financing risk. Ofwat also aggregated total risk on an additive basis. While Ofwat recognised the merit of simulated RoRE ranges for outcomes, they stopped short of using the same approach for other risks. In the context of assessing whether companies can raise sufficient investment, Monte Carlo simulated RoRE ranges can provide a closer approximation of returns available to investors and is more relevant to the assessment of the company's ability to attract investment.
- **Estimation of P50 risk as the midpoint between P10 and P90**. Generally, Ofwat assumed normal distributions with limited exceptions for some PCs. If distributions are symmetrical and normal, then approximating the P50 as the midpoint between P10 and P90 is an appropriate technique, however this is not appropriate where risks are asymmetrically distributed. The risks embedded in the FD are negatively skewed and asymmetric, meaning the midpoint materially understates base-case risk. Ofwat's own datasets were also not symmetrical or normally distributed which highlights the irrationality of the approach taken in the FD to estimate base-case risk as the midpoint.

1.2 Wholesale totex

1.2.1 Ofwat's approach in the FD

19. Ofwat calculated totex risk on a combined basis for base and enhancement. Financial outcomes were calculated by dividing totex into standard sharing (50% rate), reduce sharing (10% rate), and no sharing. The justification for the use of the methodology was that the enhancement programme is subject to 25% greater variation than base, as reflected in the reduce sharing.[7] The FD used wholesale totex data from AMP6 and implicitly assumed a symmetrical distribution to derive a ±8.5% out- and under-performance range to model the P10 and P90 of AMP8 outcomes.[8] It thus derived a P50 risk of 0bps.

[7] 50% standard base sharing is 25% higher than 40% standard enhancement sharing.
[8] Ofwat, December 2024, PR24 final determinations: Aligning risk and return – appendix, page 19, SOC-1-0008.

1.2.2 Errors in the FD approach

20. Modelling the base and enhancement totex together was flawed as they have distinct risk characteristics and therefore the FD's aggregated modelling did not provide a robust view of risk.

- The FD approach assumed that any under- and over-spend on base of ±8.5% occurs simultaneously on enhancement. In reality, overspend on complex and novel enhancement schemes are likely to occur more often and to a greater extent compared to base given their greater degree of familiarity and lower degree of novelty.
- This issue is exacerbated by the increased proportion of enhancement totex for AMP8 compared to the source data in AMP6.
- Base and enhancement have different RPEs, sharing rates, and mechanisms that impact over- and under-spend. Modelling base and enhancement together does not facilitate Monte Carlo simulations which, if used, could more appropriately capture the relationship between the types of spend.

21. The FD adopted AMP6 data and excluded the latest available information from AMP7. AMP6 data is not reflective of AMP8 and therefore potentially understates AMP8 risks for the following reasons:

- It does not capture the risks associated with the significantly increased scale and complexity of AMP8. AMP8 enhancement allowances are four times that of AMP7, and even greater than AMP6. It also does not capture the risk of overspend inherent to FD allowances being less than requested funding in DD Responses.
- Changes to risk mitigations since AMP6, such as RPEs and sharing rates, are different for base and enhancement. Impacts cannot be adequately incorporated by only considering wholesale totex or indeed tested to determine whether they sufficiently mitigate risk to Ofwat's targeted level.

22. The assumption of symmetry was inadequate for totex risk. Historical performance and third-party cross checks indicate that the distribution of cost performance is asymmetric.[9] There is a negative P50 and more scope for underperformance than outperformance. The underlying data for Ofwat's wholesale totex risk analysis shows a P50 overspend of 1.2%[10] on totex in contrast to Ofwat's 0bps. Ofwat also assumes the distribution of cost performance is symmetric by estimating the P50 as the midpoint between P10 and P90. The disregard of overspend in the P50 of the underlying data and assumption of symmetry made in the FD risk analysis understated the downside risk and base-case risk and overstates the upside potential.

1.3 PCDs

1.3.1 Ofwat's approach in the FD

23. The FD excludes consideration of the risk associated with non-delivery PCDs, which claw back allowance for units of schemes not delivered in AMP8. The stated rationale for this approach was that "*It is not appropriate that customers should pay for quality or environmental improvements that are not delivered. This element of the PCD calculation recovers additional funding not returned under cost sharing, resulting in a company being no worse off".*[11]

[9] KPMG, January 2025, PR24 Final Determinations – risk analysis for a notional company, page 21, SOC-1-0001.
[10] KPMG, January 2025, PR24 Final Determinations – risk analysis for a notional company, page 21, SOC-1-0001.The overspend is not converted into RoRE terms as AMP6 data was used. Base totex and enhancement totex are considered together and in AMP8 receive different sharing rates making an estimate of RoRE impact challenging.
[11] Ofwat, December 2024, PR24 final determinations: Aligning risk and return – appendix, SOC-1-0008.

24. Ofwat calculated time-incentive PCD risk, which introduces a penalty for late delivery and outperformance payments for timely delivery, using delivery statistics of the PR19 WINEP programme. The same data was used to calibrate the mechanism's 3:1 penalty:reward ratio. A cross check against WRMP data was also performed which showed 64% and 78% of schemes were delivered on time for metering and water supply respectively.[12]

1.3.2 Errors in the FD approach

25. The FD ignores any risks associated with non-delivery PCDs. While we acknowledge that the funding for schemes not delivered should be returned to customers, numerous factors have not been considered in the FD, resulting in the underestimation of PCD risk. There is scope for spending to occur and for allowances to be clawed back on the same scheme as a result of delays. This is compounded by the inflexible nature and lack of clarity on the application of clawbacks for schemes in the delivery phase. This is most pertinent for schemes required to meet statutory requirements where delivery would likely continue in the event of delays and clawbacks.

26. Using PR19 WINEP and WRMP data to set the penalty:reward ratio and assess the risk results in too high of a relative penalty and an understatement of the time incentive PCD risk. The penalty rate was based on Ofwat's assessment that projects are deliver on time 75% of the time creating a ratio of 75:25 or 3:1 between penalty on late projects and reward for timely delivery. We along with a group of water companies commissioned KPMG to assess the level of risk at a sector level; KPMG identified as part of this analysis a subset of projects in its infrastructure database that most closely match the characteristics of the AMP8 capital programme. The infrastructure database shows that 60% of capital projects are delivered on time.[13] Using Ofwat's methodology this would form a ratio of 60:40 or 3:2 – an increase in the reward rate versus Ofwat's calculation.

27. Ofwat adopt an assumption that 25% of projects will be late for calibrating time-incentive PCDs but do not reflect the implication this has on risk relating non-delivery PCD risk. If a proportion of projects are expected to be delivered late, as acknowledged by the setting of the penalty:reward ratio in PR24, then a proportion of the projects due at the end of AMP8 with non-delivery PCDs should also be expected to be delivered late. Ofwat are inconsistent in their assumption of late delivery when calculating RoRE risk by ignoring the risk inherent to non-delivery PCDs, as described above.

1.4 Outcomes

1.4.1 Ofwat's approach in the FD

28. To model each PC, Ofwat's risk analysis used the PCL set in the FD as the assumed 'anchor point' on base case performance or the most likely performance. The impact of this was to set P50 risk on each ODI to 0% out- or under-performance. The P10 and P90 AMP8 risks were derived using distributions calibrated on AMP6 PC performance. Some asymmetry was incorporated through the use of truncated normal distributions and water supply interruptions (**WSI**) relied on log normal distributions.

29. Ofwat converted the PC performance into financial impact using the FD parameters and then aggregated individual ODI risk using Monte Carlo simulation, incorporating correlations between

[12] Ofwat, December 2024, PR24 final determinations: Aligning risk and return – appendix, page 19, SOC-1-0008.
[13] KPMG, January 2025, PR24 Final Determinations – risk analysis for a notional company, page 50, SOC-1-0001.

key ODIs. The total outcomes simulation results included P10 and P90 and Ofwat included a midpoint as the only other output.

30. Ofwat assumed that the base-case P50 performance meets the PCL and thus has no out- or under-performance. The rationale for this approach is that the PCLs were derived taking into account historical sector performance. The FD assumed that the cap and collar would be met in the P90 and P10 scenarios. The FD states that historical outturn performance implies that companies could hit the cap and collar and therefore calibration of the risk range in this manner captures historical performance.

1.4.2 Errors in the FD approach

31. Ofwat assumed that the PCLs are achievable in the base case. This is not supported by historical data given the improvement on current performance required to achieve the AMP8 opening PCL. This means that it significantly understates P50 risk.

32. The midpoint is used to inform whether the return is balanced with risk, however, this has not been calculated appropriately. The mid-point of P10 and P90 was used as an estimate of P50; this approach incorporates an erroneous assumption of symmetry which is not supported by Ofwat's empirical data or even Ofwat's assumed underlying distributions. The KPMG analysis has calculated a P50 of -42bps[14] compared to Ofwat's midpoint of -22bps.

33. Ofwat's methodology does not provide a robust view of ODI risk due to its use of AMP6 data. AMP6 data has limited relevance to AMP8 given fewer common ODIs, changes to ODI definitions, less stretching targets, and fewer instances of extreme weather.[15]

34. Company specific characteristics that drive underperformance against common PCLs are ignored, thus understating risk. Ecological characteristics of our region, such as the prevalence of chalk streams, make meeting common performance levels, such as pollution incidents, more difficult for an efficient company operating in our region.[16]

35. Turning to measures of experience, declining customer measure of experience (**C-MeX**) scores in the sector are not considered in the risk analysis. FY26 performance is assumed to align with FY21 performance. This represents an assumed 10% improvement for us from 65.8 in FY24 to 72.3 in FY26. The same issue occurs for the sector median, which has implicitly assumed 8% improvement in score. It is not clear what investment, and assumptions support this significant improvement in C-MeX scores.

36. A symmetrical outcome in the tails is assumed, with P10 and P90 set at the ±40bps and ±20bps cap and collar for C-MeX and developer measure of experience (**D-MeX**) respectively. Historical performance data suggests that the scale of underperformance is greater than outperformance and thus the potential performance distribution is asymmetric. Underperformance at the P50 would reduce the likelihood of hitting the cap. It is unclear how the assumption of hitting the cap was justified.

37. Ofwat's recalibration of the outcomes package at the FD cannot be accurately tested in Ofwat's own risk analysis. The methodology is not able to infer whether the degree of improvement is too stretching, and median performance would likely result in penalty because it explicitly assumes all PCLs are achievable with no expected out- or under-performance. This was the same approach taken in Ofwat's risk analysis at DD and to Ofwat's own admission was not able to detect the expected penalties.[17] It underestimates downside risk through choice of data and assumption of

[14] KPMG, January 2025, PR24 Final Determinations – risk analysis for a notional company, page 20, SOC-1-0001.
[15] KPMG, January 2025, PR24 Final Determinations – risk analysis for a notional company, page 21, SOC-1-0001.
[16] KPMG, March 2025, Impact of exogenous risk factors on wastewater ODI performance, page 17, SOC-1-0004.
[17] Ofwat, December 2024, PR24 final determinations: Aligning risk and return – appendix, page 18, SOC-1-0008.

normality. This poses a challenge in calibrating risk protections like collars and the ASM thresholds. While Ofwat's recalibration did reduce risk, their analysis could not appropriately or reliably quantify this reduced risk position.

1.5 Financing

1.5.1 Ofwat's approach in the FD

38. Financing risk is calculated as the total of new debt risk, CPIH inflation, and RPI-CPIH wedge risk. New debt risk was estimated using performance of the sector debt issuances against iBoxx A/BBB non-financial 10 year+ index. Inflationary risk was based on 5-year periods spanning the last 27 years of RPI and CPIH index data. The P50 was calculated as the midpoint between the P10 and P90 under an implicit assumption of symmetry.

39. The FD excluded from the risk analysis embedded debt risk[18] and basis risk on CPI-CPIH wedge. Ofwat explained that it excluded embedded debt risk because "*variations in financial performance arising from a company's historical financing choices should influence both equity valuations and the decisions a company takes to ensure a company's capital structure and financing decisions align with the need to maintain long term financial resilience*".[19] Ofwat effectively justifies the exclusion of embedded debt by assuming companies will align their capital structure in future periods, with no regard for the potential impact in AMP8. Ofwat assumed all index-linked debt was linked to RPI and therefore the only basis risk arises from CPIH indexed RCV. Because the wedge was historically larger for RPI-CPIH than for RPI-CPI, Ofwat believes that this would benefit companies in its risk analysis and did not refine this assumption.

1.5.2 Errors in the FD approach

40. The calculation of P50 contains erroneous assumptions, which result in an underestimate of risk in P50 performance. The KPMG analysis considers the underlying data that Ofwat used to derive its P10 and P90 and calculates the P50 to be -7bps[20] compared to Ofwat's assumed midpoint of +30bps.

41. The exclusion of embedded debt risk misstated the underperformance as a result of insufficient embedded cost of debt allowance. Responding to Ofwat's rationale for excluding the risk on embedded debt, we agree that companies can align their capital structure in future periods to the notional capital structure. However, this will not influence their embedded debt performance in AMP8 as the debt is already raised. Thus, the exclusion of embedded debt risk remains an omitted risk in the risk analysis.

42. A notional company is expected to have variations in its cost of embedded debt from the allowed cost of embedded debt due to timing, quantum and type of debt being raised over time and is a relevant risk for a notionally efficient company.[21]

43. Ofwat did not employ a Monte Carlo simulation for financing risk. The regulator overstated the range of potential outcomes from its derived new debt, CPI-CPIH wedge and RPI-CPIH wedge risks by adding the individual risks together. At the same time, it understated the total range of financing outcomes by ignoring embedded debt risk.[22]

[18] Ofwat, December 2024, PR24 final determinations: Aligning risk and return – appendix, page 32, SOC-1-0008.
[19] Ofwat, December 2024, PR24 final determinations: Aligning risk and return – appendix, page 29, SOC-1-0008.
[20] KPMG, January 2025, PR24 Final Determinations – risk analysis for a notional company, page 20, SOC-1-0001.
[21] KPMG, January 2025, PR24 Final Determinations – risk analysis for a notional company, page 22, SOC-1-0001.
[22] KPMG, January 2025, PR24 Final Determinations – risk analysis for a notional company, page 22, SOC-1-0001.

44. A robust approach would require all relevant risks impacting company RoRE performance to be included and combine these risks through Monte Carlo simulation, capturing historically derived relationships between the risk components.

1.6 Market base delivery (DPC)

1.6.1 Ofwat's approach in the FD

45. Ofwat did not consider the risk attributable to appointee companies in association with the DPC delivery mechanism, where three of our enhancement schemes will be delivered by third parties. Ofwat did not attempt to estimate the risk facing the appointee arising from the market based delivery schemes, likely because the risk cannot be quantified in full until commercial arrangements are fully agreed for each scheme. There are numerous ways that the CAP could impact the appointee and have an impact on risk in AMP8. This risk modelling captures the risk of funding a retender outside of our allowances in the event of a CAP default. However, we have not been able to model the risk of delay or poor operational performance and how that may impact our ability to meet statutory obligations or performance targets set by Ofwat.

1.6.2 Errors in the FD approach

46. While most risks are specific to an individual scheme and cannot be quantified until commercial arrangements are agreed, risks relating to the cost of retendering in the event of the CAP defaulting can be quantified. Ofwat has not definitively provided for an allowance for retendering in the event of default which may result in additional costs for our programme. The risk of retendering in the event of default of the CAP is therefore an omitted risk in Ofwat's risk analysis.

1.6.3 Errors in Ofwat's evaluation of whether the FD risk is reasonable

47. The approach and resulting errors outlined above resulted in Ofwat concluding that risk in the FD is "*broadly balanced*".[23] This is not well evidenced or technically correct. The flawed risk analysis was unable to detect errors in the risk allocation or their impact on RoRE performance and hence understated the P50 risk.

48. The balance of risk and return is critical to assessing the appropriateness of a regulatory determination and its ability to support capital raising. To effectively assess the viability of a regulatory determination, robust tests are needed to confirm a company will be able to raise sufficient financing for its operations and capital programme.

49. It is not clear what tests were conducted by the regulator to assess whether the level of risk is reasonable. Ofwat concluded, based on a series of comments and considerations in the FD, that the level of risk was broadly balanced with the return, and hence that the determination was financeable.

50. Ofwat did not clearly explain how it concluded that the FD was broadly balanced and instead sporadically referred to risk throughout the appendix on risk and return. We have identified the considerations for determining risk that Ofwat took into account from Ofwat's appendix and concluded that its conclusions are not robust and not supported by evidence due to the errors outlined above.

[23] Ofwat, December 2024, PR24 final determinations: Aligning risk and return – appendix, page 10, SOC-1-0008.

51. Ofwat's stated considerations for determining that the risk in the FD is appropriate are listed below.

a) **Comparison of the median RoRE scenario to be close to zero:** Ofwat's risk analysis was flawed and materially understated the base-case P50 risk. Ofwat's own underlying data suggests that the median RoRE scenario is materially negative.[24] A robust assessment of risk would demonstrate an unacceptable level of expected penalties at the P50 and therefore rebut this claim.

b) **Comparison of the outcomes P10/P90 RoRE ranges to Ofwat's target ranges of between ±100 and ±300bps:** Ofwat's risk analysis assumes the PCL is broadly achievable and used this as the anchor point. This limits the size of the downside in P10 where targets are unrealistically stretching. Ofwat assumed a higher degree of symmetry in PC performance distributions through the use of normal and truncated normal distributions and thus understates the downside risk and overstates the upside potential. This invalidates the comparison to their targeted ranges.

c) **Comparison of the wholesale totex P10/P90 RoRE to Ofwat's target range of ±200bps:** Totex risk is materially understated due to the selection of data, assumption of normality and other errors in the risk analysis. The analysis ignores the risk relating to non-delivery PCDs, the funding gap, and the delivery risk associated with a material increase in the magnitude and complexity of the enhancement programme. It also was unable to capture the decreased risk allocation to companies driven by the newly introduced RPEs, improved cost sharing and gated allowances to test whether these sufficiently mitigated risk. Even with totex risk mitigations outlined, there is a high probability of exceeding this financial impact given the size of our cost gap in Chapter 3: Enhancement (Cost assessment).

52. Ofwat failed to reliably estimate the risks they allocated to us and incorrectly concluded that risk and return were balanced in the FD.

53. Ofwat's risk analysis is also incapable of testing the degree of risk in the capital programme due to the data selection used. This is a key risk given the growth in scale and complexity of the capital programme for us and the sector at large. The net result of these errors means that the FD does not provide a "fair bet" for companies and investors are not likely to e

[24] KPMG, January 2025, PR24 Final Determinations – risk analysis for a notional company, page 21-22, SOC-1-0001.

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Annex 7
Weighted Average Cost of Capital Appendix 1 – GIIA Position

GIIA Position

1. GIIA is a membership body for global infrastructure investors. Over 25 of its members hold stakes in two-thirds of the privately held water companies in the UK. It conducts a six-monthly pulse survey of its members and its latest survey was undertaken shortly before the FD.

2. Whilst the survey was undertaken before the FD, the survey results reflect Ofwat's regulatory approach over successive price controls so would not be expected to change if the FD was taken into account.

3. In this context, GIIA commented in its statement following the release of the FD that:

4. *"In its last two price determinations, Ofwat set the water industry on a path to potential failure by prioritising lower bills over critical investment needs while imposing unachievable targets. This approach rendered the sector increasingly unattractive to investors, as the focus on driving bills down has come at the expense of enabling the investment needed to upgrade the UK's aging water infrastructure…*

5. *GIIA's latest six-monthly Pulse Survey of global investors…highlights the long shadow Ofwat's regulatory approach has cast over the UK's broader investment appeal. Investor confidence in the water sector has been deeply shaken, with broader implications for the UK's perceived quality of regulation. This has tarnished the country's investment appeal and left it lagging behind international peers"*[1].

6. GIIA's chief executive emphasised in relation to the survey results that:

7. *"The apparent unpopularity of regulated water in the European market is almost entirely driven by the UK's privatised water sector. Looking at investors' views on barriers to investment around the world, an unattractive regulatory regime in the UK currently towers over all other obstacles"*[2].

8. Further, GIIA submitted a response to the DD[3] that captured critical concerns from its members which are consistent with those in its latest survey results. The concerns it raised at DD remain true at FD:

   - *"The current situation in the UK water industry is troubling, the public perception of the sector is at an all-time low, investors are increasingly declaring the sector uninvestable, and the regulator continues to publicly criticise companies for poor performance, setting ever more challenging targets whilst failing to equip them with the sufficient funding needed for improvement";*

[1] GIIA, December 2024, Investors assess Ofwat's final determinations and whether UK water is more investable, SOC-7-0085.
[2] GIIA, December 2024, Q4 2024 Pulse Survey: Political uncertainty on investors' minds in latest global investment survey, SOC-7-0086.
[3] GIIA, August 2024, Response to: Ofwat's PR24 Draft Determinations, SOC-7-0015.

- *"Many of our members with stakes in the water sector have been unable to provide returns to the ultimate beneficiaries of their investment for years, many of which are pension savers";*
- *"Even in cases where there is an absence of a negative return skew, the proposed nominal cost of equity of around 6.8 percent offers only a slight premium over risk-free rates and is barely above the returns for senior debt holders in the UK water sector. This rate is also significantly lower than those available in other regulated sectors globally, making the UK water sector less competitive for investor capital";* and
- *"At the same time, increased regulatory constraints, new gearing restrictions, delivery-related penalties, and a perceived unstable regulatory environment have significantly increased investors' assessment of risk in the sector. The relative risk-reward ratio that Ofwat is proposing is out of kilter with investors' needs in today's market conditions, eroding investor confidence and making it incredibly difficult and ever more expensive for the sector to secure essential capital".*

9. In summary, GIIA's position is as follows:

10. Ofwat has kept bills artificially low over successive price controls by blocking the investment needed to improve infrastructure resilience and service reliability. In particular, it has rejected the level of investment proposed by companies and even where it has accepted this, assumed companies can finance this at an implausibly low WACC. This has progressively eroded investor confidence and created a crisis in levels of resilience and service at PR24 which can only be addressed with an unprecedented scale of investment.

11. Ofwat has failed to create an attractive case for this investment at PR24 as its risk-return ratio is out of line with investors' needs. This is due to (1) a return that is only marginally above risk-free rates and significantly below the returns available in other regulated sectors globally; and (2) a return that does not justify the higher risks in the sector such as the unstable regulatory environment and heighted operational challenges. This has shaken investor confidence in the sector, deterring the necessary new capital.

12. The consequence is that Ofwat may have again discouraged the investment the sector urgently needs as in previous price controls and 'kicked the can' to a later price control.

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Annex 8

Post-remedy PR24 calculations: Agreed Ofwat errors, financeability and retail allowances

1 Technical items to consider

1. In this annex, we list additional items we ask the CMA to consider when it conducts the PR24 Redetermination. These items speak to the final calculations of the settlement, given its complexities. We stand ready to aid the CMA in its work.

2. In this annex, we discuss:

- **Ofwat errors that are already agreed:** Ofwat has already considered and agreed to act on a number of errors in the FD already. We outline these in this section, so that the CMA can take them into account when setting its final PR24 settlement;
- **Retail price calculation:** The retail price is part-calculated as a product of the wholesale average bill, in order to cover bad debt. In this section, we explain how this calculation works, such that the CMA can adjust the retail price once it concludes its wholesale final bill; and
- **Reassessment of Financeability:** In calculating the final settlement, the CMA will be setting new demands on our finances. We ask the CMA to reconsider the financeability of its conclusion and adjust financial levers to ensure Southern Water can finance its decision.

1.1 Ofwat errors that are already agreed

3. Since Ofwat published the FD, we have had a series of communications about three errors in the FD, some of which Ofwat has already agreed to change. We ask the CMA to reflect these errors in its final settlement.

- **FD-004 Error from SWS on forecast volume of sludge:** Ofwat has told us in response to query FD-004:

  "*Our initial analysis suggests that had the latest forecasts been used in the FD financial model then the price per TDS would have been £586.41 rather than £570.41, a difference of 2.8%. Our initial analysis also suggests that the impact of this error is that the Southern Water will under-recover bioresources revenue by around £10m in AMP8. We propose to correct for this error at PR29.*"

4. As the CMA is re-determining the settlement, we ask the CMA to incorporate this change, to prevent a distortion when it would be applied from 2030 onwards in PR29.

- **FD-007 Circa £50m errors in models:** Ofwat has told us in response to query FD-007: *"We intend to correct for unambiguous errors as part of the blind year process later this year. The resulting difference in required revenue will be applied via the RFI and the remaining RCV element will be adjusted for at PR29."*

Model	Value of over/(under) allowance (£2022m)
SRO	(15.7)
Raw water deterioration	(1.5)
Storm overflows	(2.5)
Growth at sewage treatment works	(28.5)

5. Again, to avoid a distortion in PR29, we ask the CMA to incorporate this change in its final settlement.

- **FD-012 – This is the same cost in FD-007 SRO:** Ofwat has told us in response to query FD-012:

  "We recognise it is important to ensure Southern Water receives funding for these costs incurred and therefore we are proposing to allow these through the strategic regional water resources reconciliation model blind year process. RAPID will ensure a separate line for this transitional spend amount is included in the next version published."

6. This error would be corrected within period. We ask the CMA to take this into account in its calculation of the settlement from year 2 of the AMP8 period.

1.2 Retail price calculation

7. The retail price is part-calculated as a product of the wholesale average bill, in order to cover bad debt. If wholesale average bills increase, we would expect an increase in bad debt, driven by the higher revenue at stake. When the CMA has finished its conclusions about the wholesale price controls, we ask the CMA to re-calculate the retail price, by using the Ofwat models to reflect the up to date bad debt allowances in the retail price control.

8. In the retail models, the CMA will need to update the average bill variable and rerun the models. In order to update the variable the CMA will need to update the AMP8 wholesale and retail revenues for household customers with the final CMA determined allowance, for the FD this is within the stata dataset as *BM9048 – Total wholesale plus residential retail revenue*. Then generate updated average bills for AMP8 with the households connected numbers as per the same stata dataset.

9. We want to engage with the CMA at this stage in its process and provide whatever help is necessary to understand this modelling.

1.3 Reassessment of financeability

10. We have reassessed financeability under the tests set out in Chapter 1 Risk and Financeability, considering:

- The suggested remedies set out in relation to risk;
- The remedied cost of capital estimated in the section on cost of capital;
- Cost allowances and RCV run-off rates in line with our response to the DD (including wholesale totex of £8.7bn); and
- An assumption that the notional company would be able to attract new equity on the basis of the remedied risk and return calibration.

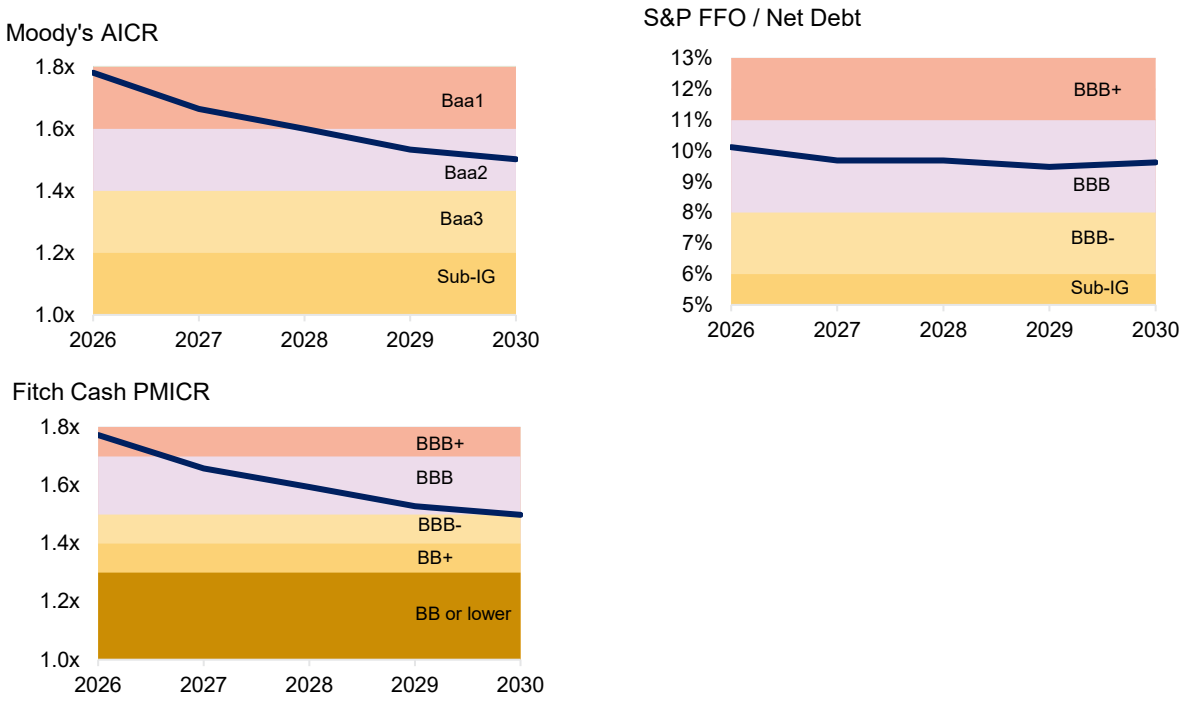
11. Once the CMA has completed its redetermination, we ask the CMA to assess the financeability of its final settlement and adjust the cashflow levers (e.g. PAYG rates and RCV run-off) to ensure that the notional company can finance its operation.

12. The remainder of this section, provides an assessment tool that can be used in this analysis.

Assessment of debt financeability

13. Figure 1 sets out the annual profile of credit metrics on the basis of the same capital structure assumptions set out in the section on risk and financeability and assuming the actual cost of embedded is in line with the allowance set out in section on cost of capital.

Figure 1: annual profile of credit metrics after implementing remedies



Source: analysis of credit metrics undertaking using Ofwat financial model, with changes to functionality made to facilitate use of assumptions and approach set out above.
Note: credit metrics calculated in line with the approach taken by the rating agencies. AICR calculated excluding the impact of revenue reprofiling.

14. Table 1 sets out the average metrics under both the expected (P50) scenario represented in figure 1 and a downside (P10) scenario, considering our suggested remedies.

Table 1: average credit metrics (AMP8) considering risk exposure and after implementing remedies

Rating	Expected (P50)	Downside (P10)
Moody's AICR	1.62x	1.23x
S&P FFO / Net Debt	9.7%	7.8%
Fitch Cash PMICR	1.61x	1.23x

15. Figure 1 and table 1 show that the notional company would be able to achieve expected credit metrics commensurate with a Baa1 rating with Moody's, albeit with very modest headroom, and a BBB+ IDR with Fitch, provided analytical judgement was applied in respect of offsetting a below-threshold PMICR against headroom under their gearing metric. The notional company would be able to achieve a well-positioned expected BBB rating with S&P, before considering downside risk.

16. Consequently the FD can be said to be financeable, on average, at Baa1/BBB+, albeit with limited headroom, and hence pass the first debt financeability test. To achieve a BBB+ rating with S&P or more strongly positioned ratings with Moody's and Fitch would require additional cashflow in AMP8, either through a further adjustment to the cost of capital, or higher RCV run-off rates (from

those assumed for this assessment) if the implied ratings are taken to imply an under-recovery of economic depreciation in AMP8. However, in view of affordability considerations, we have not proposed any further adjustment in respect of cashflows in AMP8.

17. Table 1 shows although the notional company would not be able to maintain ratings of Baa2/BBB (stable outlook) in the event of severe, but plausible downside risk (P10) materialising, it would be able to maintain investment-grade ratings with Moody's and S&P (with some uncertainty around Fitch's IDR). Remediation of that position such that the notional company would maintain ratings of Baa2/BBB (stable outlook) would required additional cashflow in AMP8, however we have not proposed any further adjustment for the reasons set out above.

18. Consequently, on the basis of our suggested remedies and in the round, the notional company can be said to be financeable in respect of debt.

Assessment of equity financeability

19. Table 2 sets out the risk-adjusted equity return for the notional company at 10th, 50th and 90th percentiles on the cost of capital, and risk exposure, considering our suggested remedies in respect of risk and our cost of capital. Returns are presented in real and nominal terms assuming CPIH inflation of 2% for comparability.

Table 2: risk-adjusted equity return for the notional company implied by the FD by percentile, assuming CPIH of 2%

	P10	P50	P90
Allowed cost of equity (real, wholesale)	7.41%	7.41%	7.41%
Risk (RoRE)	-3.51%	-0.52%	2.57%
Risk-adjusted equity return (real)	3.90%	6.89%	9.98%
Risk-adjusted equity return (nominal)	5.98%	9.03%	12.18%

20. Table 2 shows the notional company would be able to earn the allowed cost of return on an expected (P50) basis. Consequently, the notional company would pass the first financeability test (the 'fair bet' test), as it would represent a 'fair bet', and pass the third financeability test (the risk test), albeit c.47% of the real equity return would be at risk at the 10th percentile.

21. Table 2 sets out the excess nominal equity return over risk-free rates for the notional company, considering our suggested remedies, against the comparator set, split by geography and percentile (P10 and P50, recognising the impact of remedies is to mitigate expected and downside risk).

Table 3: Excess nominal equity return (over risk-free rates) for the notional company considering remedies (AMP8 average) against the comparator set, split by geography and percentile (P10 and P50)

	P10	P50	P90
Notional company (AMP8)	4.16%	7.21%	10.37%
UK & European comparators	1.73%	4.72%	11.66%
All comparators	-0.76%	4.48%	9.55%

Source: Analysis of Refinitiv data using methodology.

22. Table 3 shows that the expected excess return for the notional company, normalised for risk, is competitive against market benchmarks for comparable investments, being higher at P10 and P50, but lower at P90 than comparators in the closest geographic market (UK and Europe). Hence the

notional company passes the third financeability test (the risk test), considering our proposed remedies.

23. Were the suggested remedies to be implemented, the FD could be said to pass the fourth, qualitative, equity financeability test (the regulatory framework test), as those remedies would help to mitigate perceptions that the regulatory framework lacked stability and predictability, although concerns are likely to remain amongst investors. The suggested remedies in respect of risk would reduce the degree to which the notional company would be exposed to significant, open-ended downside risk, evidenced by the material reduction in proportion of real equity return at risk at P10, albeit some risk in respect of the ability to pay dividends, irrespective of dividend policy and other considerations, would remain.

24. Consequently, when considering the suggested remedies, as described above, the notional company would, on balance, pass all equity and debt financeability tests and be able to attract the capital required in AMP8. It should be noted there are other combinations of remedies in respect of risk and return that would also render the notional company financeable, which could equally be assessed under the same tests we have considered.

Annex 9
List of Supporting Documents

List of Supporting Documents

1.1. Chapter 1: Risk and Financeability Supporting Documents

Unique Document Reference	Author	Document Name	Document Type	Document sensitivity
SOC-1-0001	KPMG	PR24 Final Determinations – risk analysis for a notional company	PDF	Not sensitive
SOC-1-0002		Water Industry Act 1991	Website	Not sensitive
SOC-1-0003	Southern Water	SRN-DDR-012: Risk Appendix - Draft Determination Response	PDF	Not sensitive
SOC-1-0004	KPMG	Impact of exogenous risk factors on wastewater ODI performance	PDF	Not sensitive
SOC-1-0005	T. Keelin	The Metalog Distributions. Decision Analysis 13(4):243-277	PDF	Not sensitive
SOC-1-0006	Ofwat	PR24 final determinations: Expenditure allowances	PDF	Not sensitive
SOC-1-0007	Ofwat	PR24 Final Methodology – Appendix 10 Aligning risk and return	PDF	Not sensitive
SOC-1-0008	Ofwat	PR24 final determinations: Aligning risk and return – appendix	PDF	Not sensitive
SOC-1-0009	BBC	Bank cuts interest rates and slashes growth forecast	Website	Not sensitive
SOC-1-0010	Global Infrastructure Investor Association	GIIA's response to: Ofwat's PR24 Draft Determinations	PDF	Not sensitive
SOC-1-0011	Barclays	UK Water - Rating agencies and investor survey: all about contagion	PDF	Not sensitive
SOC-1-0012	Moody's ratings	Reduced predictability of regulatory environment pressures credit quality	PDF	Not sensitive
SOC-1-0013	S&P Global	U.K. Water Regulatory Framework Support, Low Financial Flexibility In Coming Regulatory Period Drive Rating Actions	Website	Not sensitive
SOC-1-0014	Fitch ratings	FD for AMP8 Will Be Crucial for De-Risking UK Water Sector	Website	Not sensitive
SOC-1-0015	Fitch ratings	Fitch Revises Osprey Acquisition's Outlook to Negative; Affirms Anglian Debt at 'A-'	Website	Not sensitive
SOC-1-0016	Ofwat	Consultation under sections 13 and 12 A of the Water Industry Act 1991 on proposed modifications to strengthen the ring-fencing licence conditions of the largest undertakers	PDF	Not sensitive
SOC-1-0017	Ofgem	RIIO-3 Sector Specific Methodology Consultation – Finance Annex	PDF	Not sensitive
SOC-1-0018		The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017	Website	Not sensitive

Unique Document Reference	Author	Document Name	Document Type	Document sensitivity
SOC-1-0019	Environment Agency	A summary of England's revised draft regional and water resources management plans	Website	Not sensitive
SOC-1-0020	Ofwat	PR19 final determinations: Aligning risk and return technical appendix	PDF	Not sensitive
SOC-1-0021	CEPA	PR24 Cost of Equity	PDF	Not sensitive
SOC-1-0022	Severn Trent	SVE3.01 - Risk and return - Draft Determination representations	PDF	Not sensitive

1.2. Chapter 2: Base Costs Supporting Documents

Unique Document Reference	Author	Document Name	Document Type	Document sensitivity
SOC-2-0001	Ofwat	PR 24 Final Determinations: Expenditure allowances – base cost modelling decision appendix	PDF	Not sensitive
SOC-2-0002	Southern Water	Our response to Ofwat's draft determination on our Business Plan for 2025–30	PDF	Sensitive Information
SOC-2-0003	CEPA	PR24 Wholesale Base Cost Modelling	PDF	Not sensitive
SOC-2-0004	Ofwat	PR 24 Draft Determinations: Expenditure allowances – Base cost modelling decision appendix	PDF	Not sensitive
SOC-2-0005	Ofwat	Econometric base cost models for PR24	PDF	Not sensitive
SOC-2-0006	Anglian Water	Response to consultation on base cost modelling for PR24	PDF	Not sensitive
SOC-2-0007	United Utilities	UUW response - Consultation on econometric base cost models for PR24	PDF	Not sensitive
SOC-2-0008	Ofwat	PR19 Final Determinations: Securing cost efficiency technical appendix	PDF	Not sensitive
SOC-2-0009	CMA	Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations	PDF	Not sensitive
SOC-2-0010	Economic Insight	Productivity and frontier shift at PR24	PDF	Not sensitive
SOC-2-0011	Ofwat	Reference of the PR19 final determinations: Costs and outcomes – response to provisional findings responses	PDF	Not sensitive
SOC-2-0012	Gov.uk	What is data quality? Routes to good quality data	Website	Not sensitive
SOC-2-0013	Ofwat	PR24 cost assessment working group: Average pumping head, connected properties and ensuring quality data	PDF	Not sensitive

Unique Document Reference	Author	Document Name	Document Type	Document sensitivity
SOC-2-0014	Turner and Townsend	Average Pumping Head: data quality improvement Ofwat	PDF	Not sensitive
SOC-2-0015	DEFRA	Agricultural facts: South East (including London) region	PDF	Not Sensitive
SOC-2-0016	Southern Water	SRN36 Bioresources Strategy Technical Annex	PDF	Sensitive Information
SOC-2-0017	Ofwat	Overview of Thames Water's PR24 final determination	PDF	Not sensitive
SOC-2-0018	Southern Water	SRN-DDR-016: Bioresources AAD Cost Adjustment Claim	PDF	Sensitive Information
SOC-2-0019	Southern Water	Five-year Business Plan 2025–30	PDF	Sensitive Information
SOC-2-0020	Ofwat	SRN CAC Feeder Model Code: PR24CA19	Excel	Not sensitive
SOC-2-0021	Bran Sands Advanced Anaerobic Digestion Facility	Northumbrian Water - from Sludge Drying to Digestion	PDF	Not sensitive
SOC-2-0022	Office for National Statistics	Annual Survey of Hours and Earnings (ASHE)	PDF	Not sensitive
SOC-2-0023	Southern Water	SRN23 Regional Wages Cost Adjustment Claim	PDF	Sensitive Information
SOC-2-0024	Ofgem	RIIO-ED2 Draft Determinations – Core Methodology Document	PDF	Not sensitive
SOC-2-0025	Office for National Statistics	Annual estimates of paid hours worked and earnings for UK employees by sex, and full-time and part-time.	Website	Not sensitive
SOC-2-0026	Ofgem	RIIO-2 Final Determinations – GD Sector Annex (REVISED)	PDF	Not sensitive
SOC-2-0027	Europe Economics	Real Price Effects and Frontier Shift – Final Assessment and Response to Company Representations	PDF	Not sensitive
SOC-2-0028	Affinity Water	AFW42 - PR24 Cost Adjustment Claims	PDF	Not sensitive
SOC-2-0029	CEPA	REGIONAL WAGE ADJUSTMENT THE NORTHERN IRELAND UTILITY REGULATOR (UR)	PDF	Not sensitive
SOC-2-0030	Southern Water	SRB-DDR-015: Coastal Population Cost Adjustment Claim	PDF	Sensitive Information
SOC-2-0031	Ofwat	Innovation Fund	Website	Not sensitive
SOC-2-0032	Economic Insight	The Importance Of A Balanced Approach To Frontier Shift	PDF	Not sensitive
SOC-2-0033	Economics Observatory	What explains the UK's productivity problem?	Website	Not sensitive
SOC-2-0034	D. Coyle, J. Mei	Diagnosing the UK Productivity Slowdown: Which Sectors Matter and Why?	PDF	Not sensitive

Unique Document Reference	Author	Document Name	Document Type	Document sensitivity
SOC-2-0035	Economics Observatory	Boosting productivity: why doesn't the UK invest enough?	Website	Not sensitive
SOC-2-0036	D.Zenghelis et al.	Boosting growth and productivity in the United Kingdom through investments in the sustainable economy	PDF	Not sensitive
SOC-2-0037	J. Reenen, X. Yang	Cracking the Productivity Code: An international comparison of UK productivity	PDF	Not sensitive
SOC-2-0038	Office for National Statistics	Productivity flash estimate and overview, UK: April to June 2024 and January to March 2024	Website	Not sensitive
SOC-2-0039	Ofwat	Our Duties	Website	Not sensitive
SOC-2-0040	CEPA	PR24 Final Determinations – Real Price Effects and the energy crisis cost adjustment mechanism	PDF	Not sensitive
SOC-2-0041	HM Treasury	The Green Book	Website	Not sensitive
SOC-2-0042	Gov.uk	Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal	Website	Not sensitive
SOC-2-0043	Ofwat	PR24 final determinations: Expenditure allowances - Thames Water gated allowance appendix	PDF	Not sensitive
SOC-2-0044	Ofwat	PR24 cost adjustment claim feeder models	Website	Not sensitive
SOC-2-0045	Southern Water	TA.12.BR01 Bioresources Treatment and Growth Business Case	PDF	Sensitive Information
SOC-2-0046	Ofwat	Base costs wastewater model 3 – bioresources model code: PR24CA93	Excel	Not sensitive
SOC-2-0047	Ofgem	RIIO-2 tools for cost assessment	PDF	Not sensitive
SOC-2-0048	Office for National Statistics	CPIH INDEX 00: ALL ITEMS 2015=100	Website	Not sensitive
SOC-2-0049	B. Oliver	Cardiff & Afan Advanced Digestion Plants	PDF	Not sensitive
SOC-2-0050	CEPA	PR19 econometric benchmarking models	PDF	Not sensitive
SOC-2-0051	Ofwat	Base costs wastewater model 3 Network Plus Model: PR24CA08	Excel	Not sensitive
SOC-2-0052	House of Lords Industry and Regulators Committee	The affluent and the effluent: cleaning up failures in water and sewage regulation	Website	Not sensitive
SOC-2-0053	S. Williams et al.	The UK Productivity Puzzle: A Survey of the Literature and Expert Views	PDF	Not sensitive
SOC-2-0054	Office for Budget Responsibility	Historical official forecasts database	Excel	Not sensitive

Unique Document Reference	Author	Document Name	Document Type	Document sensitivity
SOC-2-0055	Office for Budget Responsibility	Forecast evaluation report archives	Website	Not sensitive
SOC-2-0056	Bank of England	Monetary Policy Report - February 2025	Website	Not sensitive
SOC-2-0057	SGN	Cost assessment and benchmarking	PDF	Not sensitive
SOC-2-0058	SP Energy Networks	Cost Assessment and Benchmarking Approach (including RPEs & OE) RIIO-T3 Business Plan SP Energy Networks	PDF	Not sensitive
SOC-2-0059	National gas transmission	NGT A12 - Cost assessment and benchmarking approach	PDF	Not sensitive
SOC-2-0060	National Grid	RIIO-T3 Business Plan	PDF	Not sensitive
SOC-2-0061	Ofwat	PR24 Final Determination - Efficient Expenditure allowances - summary tables	Excel	Not sensitive
SOC-2-0062	UKWIR	Capital Maintenance Planning A Common Framework Volume 1 Overview	Website	Not sensitive
SOC-2-0063	DWI	Indicative Compliance Risk Index England and Wales	Website	Not sensitive
SOC-2-0064	Southern Water	SRN-DDR-021: Sustainable Botex Technical Annex Draft Determination Response	PDF	Sensitive Information
SOC-2-0065	KPMG	Analysis of components of Ofwat's PR24 Final Determination cost assessment	PDF	Not sensitive
SOC-2-0066	Economic Insight	Frontier shift at the PR24 redeterminations	PDF	Not sensitive
SOC-2-0067	Southern Water	Error 1 - WATS & Load 1 to 3 - Southern Water analysis	Excel	Not sensitive
SOC-2-0068	Southern Water	Error 2 - APH Final - Southern Water analysis	Excel	Not sensitive
SOC-2-0069	Southern Water	Error 4 - Regional Wages - Within model adjustment	Excel	Not sensitive
SOC-2-0070	Southern Water	Error 5 - Coastal driver	Excel	Not sensitive
SOC-2-0071	Southern Water	Error 5 - Sector wide unit costs	Excel	Not sensitive
SOC-2-0072	Southern Water	Error 6 - Frontier Shift	Excel	Not sensitive
SOC-2-0073	Southern Water	Error 8 - Asset health	Excel	Not sensitive
SOC-2-0074	Yorkshire Water	Draft Determination Representation Expenditure allowances: Part 1: Introduction and base expenditure allowances	PDF	Not sensitive
SOC-2-0075	Southern Water	SRN-DDR-013: Regional Wages - Cost Adjustment Claim	PDF	Sensitive Information
SOC-2-0076	Southern Water	Cost Adjustment Claim - The implications of coastal population on wastewater treatment costs	PDF	Sensitive Information
SOC-2-0077	Ofwat	Future water and sewerage charges 2005 -10 - Final determinations	PDF	Not sensitive

Unique Document Reference	Author	Document Name	Document Type	Document sensitivity
SOC-2-0078	Southern Water	APR extract sludge recycled to farmland	Excel	Not sensitive
SOC-2-0079	DESNZ	Data-tables-1-19	Excel	Not sensitive
SOC-2-0080	ONS	Earnings and hours worked, UK region by industry by two-digit SIC: ASHE Table 5	Website	Not sensitive
SOC-2-0081	ONS	Multi-factor productivity, annual, UK	Website	Not sensitive
SOC-2-0082	Southern Water	Coastal variable derivation	Excel	Not sensitive
SOC-2-0083	Southern Water	Internal analysis of CAD CHP engines	Excel	Sensitive Information

1.3. Chapter 3 Enhancement Expenditure Allowances

Unique Document Reference	Author	Document Name	Document Type	Document sensitivity
SOC-3-0001	Southern Water	SRN-DDR-027: Supply Resilience Enhancement Programme Enhancement Cost Evidence Case	PDF	Sensitive Information
SOC-3-0002	Southern Water	SRN-DDR-028: Water Resources – Supply: Enhancement Cost Evidence Case	PDF	Sensitive Information
SOC-3-0003	Southern Water	SRN-DDR-029: Water Resources - Demand (Leakage) Enhancement Cost Evidence Case	PDF	Sensitive Information
SOC-3-0004	Southern Water	SRN-DDR-042: Industrial Emissions Directive (IED) Enhancement Cost Evidence Case	PDF	Sensitive Information
SOC-3-0005	Southern Water	SRN-DDR-045: WINEP - Monitoring Enhancement Cost Evidence Case	PDF	Sensitive Information
SOC-3-0006	Ofwat	Creating tomorrow, together: Our final methodology for PR24	PDF	Not sensitive
SOC-3-0007	HM Government	Environmental Improvement Plan 2023	PDF	Not sensitive
SOC-3-0008	Environment Agency	Water stressed areas – final classification 2021	Word	Not sensitive
SOC-3-0009	Gov.uk	Official Statistics: Rail factsheet: 2024	Website	Not sensitive
SOC-3-0010	Ofwat	Creating tomorrow, together: Our final methodology for PR24 Appendix 9 Setting expenditure allowances	PDF	Not sensitive
SOC-3-0011	Ofwat	PR24-FD-CA05-Base-costs-water-model-3.xlsx	Excel	Not sensitive

Unique Document Reference	Author	Document Name	Document Type	Document sensitivity
SOC-3-0012	Ofwat	Creating tomorrow, together: Delivering UK government priorities for the English water sector through our 2024 price review final methodology	PDF	Not sensitive
SOC-3-0013	Environment Agency	Meeting our future water needs: a national framework for water resources	PDF	Not sensitive
SOC-3-0014	Ofwat	PR24 final determinations: Expenditure allowances - enhancement cost modelling appendix	PDF	Not sensitive
SOC-3-0015	HM Government	A Green Future: Our 25 Year Plan to Improve the Environment	PDF	Not sensitive
SOC-3-0016	Southern Water	U_MON4 sites and costs	Excel	Sensitive Information
SOC-3-0017	Ofwat	PR24 final determinations: Expenditure allowances – base cost modelling decision appendix	PDF	Not sensitive
SOC-3-0018	CMA	Bristol Water plc - A reference under section 12(3)(a) of the Water Industry Act 1991 - Report	PDF	Not sensitive
SOC-3-0019	Gov.uk	Guidance - Minimum requirements for self-monitoring of flow: MCERTS performance standard	Website	Not sensitive
SOC-3-0020	Southern Water	SRN15 Cost and Option Methodology Technical Annex	PDF	Not sensitive
SOC-3-0021	Environment Agency	Performance Standards and Test Procedures for Continuous Water Monitoring Equipment	PDF	Not sensitive
SOC-3-0022	Southern Water	SRN41 Wastewater WINEP Monitoring Enhancement Business Case	PDF	Sensitive Information
SOC-3-0023	Ofwat	PR24 Mains renewal cost adjustment model PR24CA95	Excel	Not sensitive
SOC-3-0024	Economic Insight	ISSUES WITH OFWAT'S APPROACH ON "CUSTOMERS NOT PAYING TWICE" A report for Southern Water	PDF	Not sensitive
SOC-3-0025	Ofwat	PR19 final determinations: Southern Water final determination	PDF	Not sensitive
SOC-3-0026	Southern Water	ALM & SLM Indicative Spend Profiles	Excel	Sensitive Information
SOC-3-0027	UK Water Industry Research	Review of water mains serviceability indicators and condition grading - Volume 2 mains condition grading	Website	Not sensitive
SOC-3-0028	UK Water Industry Research	The asset inventory: A simplified alternative approach	Website	Not sensitive
SOC-3-0029	Ofwat	Reliability and availability	Website	Not sensitive
SOC-3-0030	Ofwat	PR24 Final Methodology submission table guidance – section 3: Costs (wholesale) – water	PDF	Not sensitive
SOC-3-0031	Ofwat	CW20 Distribution mains condition analysis	Excel	Not sensitive
SOC-3-0032	Ofwat	PR14 Review	PDF	Not sensitive

Unique Document Reference	Author	Document Name	Document Type	Document sensitivity
SOC-3-0033	Environment Agency	wrmp24_template-tables_sws_2024_07_04_semd_checked-signed_ea_feedback_2-copy	Excel	Not sensitive
SOC-3-0034	Southern Water	SRN Outbound Query Response OFW-OBQ-SRN-124	PDF	Not sensitive
SOC-3-0035	Southern Water	SRN Outbound Query Response OFW-OBQ-SRN-125	PDF	Not sensitive
SOC-3-0036	Southern Water	SRN Outbound Query Response OFW-OBQ-SRN-166	PDF	Sensitive Information
SOC-3-0037	Southern Water	SRN Outbound Query Response OFW-OBQ-SRN-247	PDF	Not sensitive
SOC-3-0038	Southern Water	OFW-REP-SRN-060	Word	Not sensitive
SOC-3-0039	Southern Water	OFW-REP-SRN-089 - Response	PDF	Sensitive Information
SOC-3-0040	Mott MacDonald	PR24 Enhancement case review - 4 Sites Enhancement Case	PDF	Sensitive Information
SOC-3-0041	Ofwat	FM_E_WWW_flow-monitoring_FD	Excel	Not sensitive
SOC-3-0042	Southern Water	SRN PR 24 Outbound Query Response OFW-OBQ-SRN-019	PDF	Not sensitive
SOC-3-0043	Southern Water	SRN PR 24 Outbound Query Response OFW_OBQ-SRN-091	PDF	Not sensitive
SOC-3-0044	Southern Water	SRN PR 24 Outbound Query Response OFW-OBQ-SRN-112	PDF	Not sensitive
SOC-3-0045	Southern Water	SRN PR 24 Outbound Query Response OFW-OBQ-SRN-252	PDF	Sensitive Information
SOC-3-0046	Southern Water	PR 24 Representation Outbound Query Form OFW-REP-SRN-075	PDF	Sensitive Information
SOC-3-0047	Environment Agency	PR24 Supporting Guidance: WINEP Option Assessment Report and WINEP line requirements	PDF	Not sensitive
SOC-3-0048	Environment Agency	List of PR24 guidance documents on SharePoint	Excel	Not sensitive
SOC-3-0049	Environment Agency	Water Industry National Environment Programme U_MON6 Phasing	PDF	Not sensitive
SOC-3-0050	Southern Water	PR24 Representation Outbound Query Form Ref – OFW-REP-SRN-029	PDF	Sensitive Information
SOC-3-0051	Southern Water	PR24 Representation Outbound Query Form Ref – OFW-REP-SRN-066	PDF	Not sensitive
SOC-3-0052	Southern Water	SRN-DDR-045 - WINEP - Monitoring Enhancement Cost Evidence Case	PDF	Sensitive Information
SOC-3-0053	Gov.uk	Guidance: Water resources planning guideline	Website	Not sensitive
SOC-3-0054	Ofwat	PR24 draft determinations Quality and ambition summary	PDF	Not sensitive
SOC-3-0055	DWI	Southern Water Services Limited – Weirwood Multi Phase Reference: SRN-2024-00016 V1	PDF	Sensitive Information

Unique Document Reference	Author	Document Name	Document Type	Document sensitivity
SOC-3-0056	Mott MacDonald	Smock Alley-Cost Assurance Submittal-R&V 3.2-R1	PDF	Sensitive Information
SOC-3-0057	Southern Water	SRN Outbound Query Response OFW-OBQ-SRN-232	PDF	Sensitive Information
SOC-3-0058	DWI	SRN_2022_00001_[redacted]FEO	PDF	Sensitive Information
SOC-3-0059	DWI	SRN_2022_00010_[redacted]_FEO (002)	PDF	Sensitive Information
SOC-3-0060	Ofwat	PR24-FD-CA89-Wastewter-Industrial-emissions-directive-enhancment-expenditure-model_redacted	Excel	Not sensitive
SOC-3-0061	Southern Water	SRN October 2024 supplementary submisssion	PDF	Sensitive Information
SOC-3-0062	Southern Water	OFW-REP-SRN-060 IED dataset	Excel	Sensitive Information
SOC-3-0063	Southern Water	OFW-OBQ-SRN-124 IED information request	Excel	Sensitive Information
SOC-3-0064	Ofwat	PR19-final-determinations-Thames-Water-Cost-efficiency-additional-information-appendix	PDF	Not sensitive
SOC-3-0065	Defra	Water (Special Measures) Bill – Monitoring Emergency Overflows	PDF	Not sensitive
SOC-3-0066	Southern Water	Assurance of WRMP leakage case	Excel	Sensitive Information

1.4. Chapter 4 Treatment of Uncertainty Through Mechanisms Supporting Documents

Unique Document Reference	Author	Document Name	Document Type	Document sensitivity
SOC-4-0001	Southern Water	SRN58 Uncertainty Mechanisms Technical Annex	PDF	Sensitive Information
SOC-4-0002	Southern Water	Delayed Allowance Mechanism DRAFT proposal to Ofwat – FOR DISCUSSION	PDF	Sensitive Information
SOC-4-0003	Ofwat	PR24 draft determinations: Expenditure allowances	PDF	Not sensitive
SOC-4-0004	Ofwat	Technical Discreteness Guidance	PDF	Not sensitive
SOC-4-0005	Southern Water	Email - Subject: "Meeting note - 31_10_2034 - Delivery Mechanism"	PDF	Sensitive Information
SOC-4-0006	Southern Water	SRN39 WINEP Enhancing Wastewater Treatment Enhancement Business Case	PDF	Sensitive Information
SOC-4-0007	Southern Water	SRN40 WINEP – Storm Overflows Enhancement Business Case	PDF	Sensitive Information
SOC-4-0008	Ofwat	Notification of the PR24 final determination of price controls for Southern Water Services Limited	PDF	Not sensitive

Unique Document Reference	Author	Document Name	Document Type	Document sensitivity
SOC-4-0009	Southern Water Services Limited	Weirwood Multi Phase - Notice under regulation 28(4) of the Water Supply (Water Quality) Regulations 2016 (as amended)	Website	Not sensitive
SOC-4-0010	Southern Water	SRN-DDR-027: Supply Resilience Enhancement Programme Enhancement Cost Evidence Case	PDF	Sensitive Information
SOC-4-0011	Southern Water	SRN-DDR-039: MarketBased Delivery	PDF	Sensitive Information
SOC-4-0012	Southern Water	SRN17 Direct Procurement for Customers and Alternative Delivery Model Technical Annex	PDF	Sensitive Information
SOC-4-0013	Ofwat	PR24 final determinations: Major projects development and delivery	PDF	Not sensitive
SOC-4-0014	Ofwat	Review of the bioresources market – consultation	PDF	Not sensitive
SOC-4-0015	Jacobs	Bioresources Market Review	PDF	Not sensitive
SOC-4-0016	Ofwat	Water 2020: our regulatory approach for water and wastewater services in England and Wales	PDF	Not sensitive
SOC-4-0017	Office of Fair Trading	Organic waste An OFT market study	PDF	Not sensitive
SOC-4-0018	Ofwat	Bioresources market	Website	Not sensitive
SOC-4-0019	Ofwat	Notification of the PR24 final determination of price controls for Anglian Water Services Limited	PDF	Not sensitive
SOC-4-0020	Ofwat	Notification of the PR24 final determination of price controls for Dŵr Cymru Cyfyngedig	PDF	Not sensitive
SOC-4-0021	Ofwat	Notification of the PR24 final determination of price controls for Hafren Dyfrdwy Cyfyngedig	PDF	Not sensitive
SOC-4-0022	Ofwat	Notification of the PR24 final determination of price controls for Northumbrian Water Limited	PDF	Not sensitive
SOC-4-0023	Ofwat	Notification of the PR24 final determination of price controls for Severn Trent Water Limited	PDF	Not sensitive
SOC-4-0024	Ofwat	Notification of the PR24 final determination of price controls for South West Water Limited	PDF	Not sensitive
SOC-4-0025	Ofwat	Notification of the PR24 final determination of price controls for Thames Water Utilities Limited	PDF	Not sensitive
SOC-4-0026	Ofwat	Notification of the PR24 final determination of price controls for United Utilities Water Limited	PDF	Not sensitive
SOC-4-0027	Ofwat	Notification of the PR24 final determination of price controls for Wessex Water Services Limited	PDF	Not sensitive

Unique Document Reference	Author	Document Name	Document Type	Document sensitivity
SOC-4-0028	Ofwat	Notification of the PR24 final determination of price controls for Yorkshire Water Services Limited	PDF	Not sensitive
SOC-4-0029	Ofwat	PR24 final determinations: In-period adjustments	PDF	Not sensitive
SOC-4-0030	Southern Water	SRN-DDR-031: Water Resources – Smart Metering Enhancement Cost Evidence Case	PDF	Sensitive Information
SOC-4-0031	Ofwat	Direct Procurement for Customers - Technical discreteness guidance	PDF	Not sensitive
SOC-4-0032	Ofwat	Email - Subject: "RE_ Ofwat_SRN - update on bespoke iDoK"	PDF	Sensitive Information

1.5. Chapter 5 Price Control Deliverables (PCDs) Supporting Documents

Unique Document Reference	Author	Document Name	Document Type	Document sensitivity
SOC-5-0001	Ofwat	PR24 and beyond: Creating tomorrow, together', Framework Consultation	PDF	Not sensitive
SOC-5-0002	Ofwat	Creating tomorrow, together: consulting on our methodology for PR24 - Appendix 9 Setting expenditure allowances	PDF	Not sensitive
SOC-5-0003	Ofwat	Creating tomorrow, together: Our final methodology for PR24 - Appendix 9 Setting expenditure allowances	PDF	Not sensitive
SOC-5-0004	Ofwat	IN 23/05 Further guidance on price control deliverables for PR24	PDF	Not sensitive
SOC-5-0005	Office for National Statistics	Statistical bulletin - Vacancies and jobs in the UK	PDF	Not sensitive
SOC-5-0006	Ofwat	PR24 and beyond: Creating tomorrow, together	PDF	Not sensitive
SOC-5-0007	Ofgem	RIIO-3 Sector Specific Methodology Decision – Overview Document	PDF	Not sensitive
SOC-5-0008	Southern Water	SRN-DDR-043: WINEP Nutrients Phosphorus (P) and Nitrogen (N) Schemes	PDF	Sensitive Information
SOC-5-0009	Ofwat	Gate three final decision for Hampshire Water Transfer and Water Recycling Project	PDF	Not sensitive
SOC-5-0010	Southern Water	SRN-DDR-017: Wastewater Growth Network Reinforcement Cost Adjustment Claim	PDF	Not sensitive
SOC-5-0011	Ofwat	PR24 final determinations: Price control deliverables appendix	PDF	Not sensitive

Unique Document Reference	Author	Document Name	Document Type	Document sensitivity
SOC-5-0012	Ofwat	Enforcement case into Thames Water's potential delays in meeting key environmental protection programmes	PDF	Not sensitive
SOC-5-0013	Southern Water	PR24 DDR Business plan tables - version 7	Excel	Not sensitive
SOC-5-0014	Ofwat	Investigation into Thames Water's failure to meet its leakage performance commitments	PDF	Not sensitive
SOC-5-0015	Ofwat	Enforcement case in Thames Water's management of its sewage treatment works and sewerage networks	PDF	Not sensitive
SOC-5-0016	Ofwat	Enforcement case in Yorkshire Water's management of its sewage treatment works and sewerage networks	PDF	Not sensitive
SOC-5-0017	Ofwat	Enforcement case in Northumbrian Water's management of its sewage treatment works and sewerage networks	PDF	Not sensitive
SOC-5-0018	Gov.uk	Water industry national environment programme (WINEP) methodology	Website	Not sensitive
SOC-5-0019	Southern Water	SRN-DDR-044: WINEP – Storm Overflows Enhancement Cost Evidence Case	PDF	Sensitive Information
SOC-5-0020	Ofgem	Price Control Deliverable Reporting Requirements and Methodology Document: Version 4	PDF	Not sensitive
SOC-5-0021	Ofwat	Creating tomorrow, together: our final methodology for PR24	PDF	Not sensitive
SOC-5-0022	Ofwat	PR24CA109 Water Resilience and Security PCDs [Extract]	PDF	Sensitive Information

1.6. Chapter 6 Performance Commitments (PCs) and Outcome Delivery Incentives (ODIs) Supporting Documents

Unique Document Reference	Author	Document Name	Document Type	Document sensitivity
SOC-6-0001	Ofwat	PR24: Using collaborative customer research to set outcome delivery incentive rates	PDF	Not sensitive
SOC-6-0002	Ofwat	Historical performance	Website	Not sensitive
SOC-6-0003	Ofwat	Service and delivery report	PDF	Not sensitive
SOC-6-0004	Ofwat	Delivering Water 2020: Our methodology for the 2019 price review Appendix 2: Delivering outcomes for customers	PDF	Not sensitive

Unique Document Reference	Author	Document Name	Document Type	Document sensitivity
SOC-6-0005	Ofwat	Water company performance report 2023/24 data	Excel	Not sensitive
SOC-6-0006	Southern Water	Our Business Turnaround Plan	Website	Not sensitive
SOC-6-0007	Ofwat	PR24-FD-PD14-Cost-sharing-reconciliation	Excel	Not sensitive
SOC-6-0008	Ofwat	Setting price controls for 2015-20 Final price control determination notice: policy chapter A2 – outcomes	PDF	Not sensitive
SOC-6-0009	CAA	Future of service quality regulation for Heathrow Airport Limited: Consultation on the design principles for a more outcome-based regime	PDF	Not sensitive
SOC-6-0010	Ofwat	Creating tomorrow, together: Our final methodology for PR24 Appendix 8 Outcome delivery incentives	PDF	Not sensitive
SOC-6-0011	Ofwat	PR24 Draft determinations: Delivering outcomes for customers and the environment	PDF	Not sensitive
SOC-6-0012	Ofwat	PR24-FD-OC03-ODI-rates	Excel	Not sensitive
SOC-6-0013	Southern Water	ODI PR19 vs PR24 unit rates graph	PDF	Not sensitive
SOC-6-0014	Water UK	National Storm Overflows Plan for England	PDF	Not sensitive
SOC-6-0015	Ofwat	ODI payments calc_23_24 performane flatlined	Excel	Not sensitive
SOC-6-0016	Ofwat	PR24 final determinations - Outcomes approach to risk modelling appendix	PDF	Not sensitive
SOC-6-0017	Ofwat	Setting price controls for 2015-20: Final price control determination notice: company-specific appendix – Southern Water	PDF	Not sensitive
SOC-6-0018	Gov.uk	DEFRA - Consultation outcome - Summary of responses and government response	Website	Not sensitive
SOC-6-0019	Ofgem	RIIO-ED2 Methodology Decision: Annex 1 - Delivering value for money services for consumers	PDF	Not sensitive
SOC-6-0020	Climate change committee	Independent Assessment of UK Climate Risk	PDF	Not sensitive
SOC-6-0021	Grant Thornton	A review of Ofwat's PR24 approach to ODIs	PDF	Not sensitive
SOC-6-0022	Ofwat	PR24: Consultation on outturn adjustment mechanism	PDF	Not sensitive
SOC-6-0023	Environment Agency	Incidents and their classification: the Common Incident Classification Scheme (CICS)	PDF	Not sensitive
SOC-6-0024	Ofgem	RIIO-2 Regulatory Financial Performance Reporting – Regulatory Instructions and Guidance Version 1.0	PDF	Not sensitive
SOC-6-0025	Ofgem	ED3 Framework Consultation	PDF	Not sensitive

Unique Document Reference	Author	Document Name	Document Type	Document sensitivity
SOC-6-0026	Southern Water	CMA SoC_PCs_ODIs_supporting analysis	Excel	Not sensitive
SOC-6-0026a	Southern Water	ODI-rates calculations_CMA evidence	Excel	Not sensitive
SOC-6-0026b	Southern Water	PR24-FD-OC31-ODI-Rates-C-MeX rates calculations_CMA evidence	Excel	Not sensitive
SOC-6-0026c	Southern Water	PR24-FD-OC32-ODI-Rates-D-MeX rates calculations_CMA evidence	Excel	Not sensitive
SOC-6-0027	DWI	Compliance risk index	PDF	Not sensitive
SOC-6-0028	Environment Agency	Water and sewerage company Environmental Performance Assessment (EPA) methodology (version 11) for 2021 to 2025	PDF	Not sensitive
SOC-6-0029	Ofwat	PR24 Final determinations: Delivering outcomes for customers and the environment	PDF	Not sensitive
SOC-6-0030	Southern Water	Total Pollutions_Storm Overflow_supporting graphs	PDF	Not sensitive
SOC-6-0031	Ofwat	PR24 Final Methodology submission table guidance – section 1: Outcomes	PDF	Not sensitive
SOC-6-0032	Southern Water	Southern Water response to Ofwat consultation on the measures of experience performance commitments at PR24	PDF	Not sensitive
SOC-6-0033	Ofwat	PR 19 Final Determinations - Southern Water – Outcomes performance commitment appendix	PDF	Not sensitive
SOC-6-0034		Document no longer included in Statement of Case		
SOC-6-0035	Ofwat	PR24 Common performance commitments - Customer contacts about water quality	PDF	Not sensitive
SOC-6-0036	Southern Water	SRB-DDR-015: Coastal Population - Cost adjustment claim	PDF	Not sensitive
SOC-6-0037	Southern Water	Historical Industry application of OAM_analysis	PDF	Not sensitive
SOC-6-0038	DEFRA	Storm Overflows Discharge Reduction Plan	PDF	Not sensitive

1.7. Chapter 7 Weighted Average Cost of Capital (WACC) Supporting Documents

Unique Document Reference	Author	Document Name	Document Type	Document sensitivity
SOC-7-0001	Southern Water	WACC Data book	Excel	Sensitive Information
SOC-7-0002	Oxera	Investability at PR24: Final report for Water UK	PDF	Not sensitive

Unique Document Reference	Author	Document Name	Document Type	Document sensitivity
SOC-7-0003	National Grid	US Databook - New York and New England regulated businesses	PDF	Not sensitive
SOC-7-0004	Oxera	PR24 Investor Engagement Report: Final report for Water UK	PDF	Not sensitive
SOC-7-0005	Ofwat	PR24 final determinations - Aligning risk and return – allowed return appendix	PDF	Not sensitive
SOC-7-0006	J.P. Morgan	SVT, NTGY, EU/FRENCH GAS,NTGY/AENA, PNN	PDF	Not sensitive
SOC-7-0007	Ofwat	PR24 final determinations - Quality and ambition assessment summary	PDF	Not sensitive
SOC-7-0008	E. Fama et al.	A Five-Factor Asset Pricing Model	PDF	Not sensitive
SOC-7-0009	Moody's	Ofwat's draft determination increases sector risk	PDF	Sensitive Information
SOC-7-0010	S&P	Utilities Handbook 2024	PDF	Sensitive Information
SOC-7-0011	GIIA	INFRASTRUCTURE PULSE Q4 2024 Survey	PDF	Not sensitive
SOC-7-0012	Barclays	UK Water - Rating agencies and investor survey: all about contagion	PDF	Sensitive Information
SOC-7-0013	Goldman Sachs	Infrastructure: an Evolving Asset Class	PDF	Not sensitive
SOC-7-0014	Affinity Water	PR24 Draft Determination Representation	PDF	Not sensitive
SOC-7-0015	GIIA	Response to: Ofwat's PR24 Draft Determinations	PDF	Not sensitive
SOC-7-0016	Ofwat	Water company performance report 2023-24	PDF	Not sensitive
SOC-7-0017	K. Hou et al.	Digesting Anomalies: An Investment Approach	PDF	Sensitive Information
SOC-7-0018	Moody's	Moody's Ratings downgrades Thames Water's CFR to Caa3, stable outlook	PDF	Sensitive Information
SOC-7-0019	UK Regulators Network	Guidance for regulators on the methodology for setting the cost of capital	PDF	Not sensitive
SOC-7-0020	CMA	Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations - Provisional findings	PDF	Not sensitive
SOC-7-0021	Ofgem	RIIO-3 Sector Specific Methodology Decision – Finance Annex	PDF	Not sensitive
SOC-7-0022	Brennan	Capital Market Equilibrium with Divergent Borrowing and Lending Rates	PDF	Sensitive Information
SOC-7-0023	CMA	Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations - Final report	PDF	Not sensitive
SOC-7-0024	CAA	Economic regulation of Heathrow Airport Limited: H7 Final Decision - Section 3 Financial issues and implementation	PDF	Not sensitive
SOC-7-0025	CAA	Economic Regulation of NATS (En Route) plc: Final Decision for the NR23 (2023 to 2027) price control review	PDF	Not sensitive

Unique Document Reference	Author	Document Name	Document Type	Document sensitivity
SOC-7-0026	Utility Regulator	GD23 - Gas Distribution Price Control 2023-2028 - Final determination main report	PDF	Not sensitive
SOC-7-0027	Utility Regulator	Northern Ireland Electricity Networks Ltd - Transmission and Distribution 7th Price Control (RP7) - Final determination main report	PDF	Not sensitive
SOC-7-0028	Bundesnetzagentur	Determination of equity interests rates for 1st to 4th regulatory periods	Website	Not sensitive
SOC-7-0029	ARERA	Rate of return for electricity and gas sectors for the period 2022-2027	Website	Not sensitive
SOC-7-0030	Berk and DeMarzo	Corporate Finance	PDF	Not sensitive
SOC-7-0031	Brealey, Myers, Allen and Edmans	Principles of Corporate Finance - Part Two Risk - Chapter 8-22	PDF	Sensitive Information
SOC-7-0032	Ofwat	Creating tomorrow, together: Our final methodology for PR24 Appendix 11 Allowed return on capital	PDF	Not sensitive
SOC-7-0033	Black	Capital Market Equilibrium with Restricted Borrowing	PDF	Sensitive Information
SOC-7-0034	KPMG	Estimating the Cost of Capital for PR24	PDF	Sensitive Information
SOC-7-0035	Berk and DeMarzo	Corporate Finance - Page 440	PDF	Sensitive Information
SOC-7-0036	W. Diamond et al.	Risk-Free Rates and Convenience Yields Around the World	PDF	Not sensitive
SOC-7-0037	S. Tella et al	The zero-beta interest rate	PDF	Not sensitive
SOC-7-0038	S. Schaefer	Comments on CMA views on Estimating Expected Returns	PDF	Sensitive Information
SOC-7-0039	Frontier Economics	Updated cost of equity cross-check evidence	PDF	Not sensitive
SOC-7-0040	Competition Commission	Notice of Reference: Determination of Adjustment Factor for the period 2010-2015 - Appendix N	PDF	Not sensitive
SOC-7-0041	Fitch	Fitch Affirms UUW's Senior Unsecured at 'A-'; Downgrades UU's Senior Unsecured to 'BBB+'	Website	Not sensitive
SOC-7-0042	Bank of England	The UK economy during Covid-19: insights from the Bank of England's Citizens' Panels	Website	Not sensitive
SOC-7-0043	Institute for Government	Timeline of UK government coronavirus lockdowns and restrictions	PDF	Not sensitive
SOC-7-0044	CMA	H7 heathrow airport licence modification appeals	PDF	Not sensitive
SOC-7-0045	Ofwat	PR24 draft determinations - Aligning risk and return – Allowed return appendix	PDF	Not sensitive
SOC-7-0046	Wessex Water	Response to Ofwat's PR24 draft determination - Annexure 6 - EI Report on Asset Growth and Systematic Risk	PDF	Not sensitive

Unique Document Reference	Author	Document Name	Document Type	Document sensitivity
SOC-7-0047	CEPA	PR24 Cost of Equity	PDF	Not sensitive
SOC-7-0048	Barclays	Increasing certainty should re-rate sector	PDF	Sensitive Information
SOC-7-0049	Barclays	Breaking the water cycle – no longer so positive	PDF	Sensitive Information
SOC-7-0050	KPMG	Estimating the Cost of Equity for PR24	PDF	Not sensitive
SOC-7-0051	CMA	RIIO-2 Final Determination Volume 2A: Cost of equity	PDF	Not sensitive
SOC-7-0052	Cochrane	Asset Pricing - Revised edition	PDF	Not sensitive
SOC-7-0053	R. Merton	On the pricing of corporate debt: the risk structure of interest rates	PDF	Not sensitive
SOC-7-0054	M. Campbello et al.	Expected returns, yield spreads, and asset pricing tests	PDF	Not sensitive
SOC-7-0055	A. Damodaran	Equity risk premiums (ERP): determinants, estimation and implications - The 2023 edition	PDF	Not sensitive
SOC-7-0056	KPMG	Assessing the balance of evidence in PR24 FD CoE estimates	PDF	Sensitive Information
SOC-7-0057	J. Graham	Presidential Address: Corporate Finance and Reality	PDF	Not sensitive
SOC-7-0058	A. Kovner et al.	Evaluating Regulatory Reform: Banks' Cost of Capital and Lending	PDF	Not sensitive
SOC-7-0059	CMA	NATS RP3 Final Determination - Appendices and glossary	PDF	Not sensitive
SOC-7-0060	S. Wright et al.	Estimating the cost of capital for implementation of price controls by UK Regulators	PDF	Not sensitive
SOC-7-0061	R. Tharyan et al.	An Investigation of Multi-factor Asset Pricing Models in the UK	PDF	Not sensitive
SOC-7-0062	Bank of England	Quarterly Bulletin, 2017 Q2, Topical article :An improved model for understanding equity prices	PDF	Not sensitive
SOC-7-0063	Ofgem	RIIO-2 Sector Specific Methodology Annex: Finance	PDF	Not sensitive
SOC-7-0064	P. Fernandez et al.	Survey: Market Risk Premium and Risk-Free Rate used for 96 countries in 2024	PDF	Not sensitive
SOC-7-0065	Ofwat	PR24 final determinations - Aligning risk and return – appendix	PDF	Not sensitive
SOC-7-0066	Ofcom	Approach to risk in the assessment of the cost of capital	PDF	Not sensitive
SOC-7-0067	Ofcom	Wholesale Local Access Market Review: Statement – Volume 1 - Markets, market power determinations and remedies	PDF	Not sensitive
SOC-7-0068	CMA	SONI Limited v Northern Ireland Authority for Utility Regulation - Final determination	PDF	Not sensitive
SOC-7-0069	KPMG	Cost of Embedded Debt – analysis of and commentary on Ofwat's PR24 DD position	PDF	Not sensitive

Unique Document Reference	Author	Document Name	Document Type	Document sensitivity
SOC-7-0070	Ofwat	PR24-FD-RR02-Cost-of-debt	Excel	Not sensitive
SOC-7-0071	Ofwat	Water 2020: consultation on the approach to the cost of debt for PR19	PDF	Not sensitive
SOC-7-0072	KPMG	Estimating the Cost of Embedded Debt and Share of New Debt for PR24 - SRN appendix	PDF	Sensitive Information
SOC-7-0073	Southern Water	SRN CoD Tool	Excel	Sensitive Information
SOC-7-0074	Southern Water	PR24 DDR financial model	Excel	Not sensitive
SOC-7-0075	Ofwat	Water 2020: Regulatory framework for wholesale markets and the 2019 price review	PDF	Not sensitive
SOC-7-0076	Financial Reporting Council	FRS 102 The Financial Reporting Standard applicable in the UK and Republic of Ireland	PDF	Not sensitive
SOC-7-0077	Ofwat	IN 20/01 Requirements and expectations for ring-fencing certificates	PDF	Not sensitive
SOC-7-0078	United Utilities	Annual Report and Financial Statements for the year ended 31 March 2024	PDF	Not sensitive
SOC-7-0079	Yorkshire Water	Annual Report and Financial Statements for the year ended 31 March 2024	PDF	Not sensitive
SOC-7-0080	Thames Water	Annual Report 2023/24	PDF	Not sensitive
SOC-7-0081	Severn Trent	Annual Report and Accounts 2024	PDF	Not sensitive
SOC-7-0082	Ofwat	IN 23/04 Guidance on factors Ofwat considers in assessing dividends declared or paid	PDF	Not sensitive
SOC-7-0083	J.P. Morgan	A rising tide lifts all ships	PDF	Not sensitive
SOC-7-0084	United Utilities	PR24 Final Determination investor presentation	PDF	Not sensitive
SOC-7-0085	GIIA	Investors assess Ofwat's final determinations and whether UK water is more investable	Website	Not sensitive
SOC-7-0086	GIIA	Q4 2024 Pulse Survey: Political uncertainty on investors' minds in latest global investment survey	Website	Not sensitive
SOC-7-0087	Ofwat	PR24 and beyond: Discussion paper on risk and return	PDF	Not sensitive
SOC-7-0088	Ofwat	Creating tomorrow, together: consulting on our methodology for PR24 - Appendix 11 – Allowed return on capital	PDF	Not sensitive

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