April 2025

PR24 redeterminations

Expenditure allowances – cost adjustment claims

Ofwat

Executive summary

Our econometric base cost models are the starting point of our base cost assessment. They capture the key cost drivers that explain variations in efficient base expenditure between companies and over time.

We recognise these may not capture all factors that drive differences in efficient costs. The cost adjustment claim process allowed companies to present evidence of unique operating circumstances, non-standard legal requirements or atypical expenditure which drive higher efficient costs for the company relative to its peers; or if the company did not consider that historical costs are a good reflection of future costs.

This document focuses on our assessment of company specific cost adjustment claims submitted by the disputing companies.

This document should be read alongside our:

- Cross cutting expenditure allowances response to statement of cases document, which includes issues relating to our sector wide cost adjustments (mains renewals; meter renewals; network reinforcement; phosphorus removal; energy and net zero).

- Asset health cross-cutting response to statement of cases document.

We summarise the key points from our assessment of company specific cost adjustment claims below.

Table 1 : overview of our cost adjustment claim assessment

Cost adjustment claim	Key points	Value of request	FD Decision
Anglian Water			
Leakage	• We rejected the need for adjustment at final determinations. We retain this view based on the new evidence provided • The company does not provide compelling evidence to show that companies with low leakage levels incur higher leakage costs than companies with higher leakage levels. • It is misleading to refer to the conclusions of the PR19 redeterminations, since the empirical evidence has improved.	£67.6m	Not accepted
Boundary box replacements	• We rejected the need for adjustment at final determinations. We retain this view based on the new evidence provided • The company provides limited evidence to justify its assumptions on the need for replacement of boundary boxes.	£138m	Not accepted

	• The company has not taken into account the scope for efficiency between its meter and boundary box replacement programmes • The company has not provided compelling evidence to demonstrate costs are efficient.		
Storage points and gravity sewers capital maintenance	• This is a new cost adjustment claim. The company previously proposed that this investment can be delayed until AMP9. • We consider the company has not presented compelling evidence to demonstrate the need for an adjustment. • The company has not determined what base buys. So we cannot ascertain what should be delivered through existing base allowances to avoid customers paying twice. • The company has not included outputs relating to the investment that we could hold the company to account to. • The enhancing asset health understanding workstream provides a clear and certain route for additional base expenditure allowances where sector wide asset health issues are identified.	£150m	New request
Northumbrian Water			
Other capital maintenance	• We rejected the need for adjustment at final determinations. We retain this view based on the new evidence provided. • The company has not come to a sensible view of what base buys. This risks customers paying twice. Once through existing base allowances, and again through an adjustment. • Base expenditure allowances have been sufficient to maintain asset health and the company has underspent these allowances. • The scope of the company's proposal has changed significantly since final determination, raising questions about the investment included and its asset management and maturity. • The company has included poorly evidenced outputs relating to the investment, and there is large variance in the costs with only a small proportion are benchmarked. • The enhancing asset health understanding workstream provides a clear and certain route for additional base expenditure allowances where sector wide asset health issues are identified. For example, a need to move towards a more sustainable renewal rate.	£179.5m	Not accepted
Southern Water			
Advanced anaerobic digestion	• We rejected the need for adjustment at final determinations. We retain this view based on the new evidence provided. • We retain our final determination position that the combination of the implicit allowance from the base cost models, cost sharing, and future opex savings is sufficient to allow Southern Water to deliver advanced anaerobic digestion upgrades with existing bioresources base expenditure allowances.	£102m	Not accepted

	• The CMA may want to consider introducing a price control deliverable so that the company does not continue to defer the investment.		
Regional wages	• We rejected the need for adjustment at final determinations. We retain this view based on the new evidence provided. • Our analysis shows that regional wage differentials are sufficiently explained by population density, which is a key cost driver in the base cost models.	£158m	Not accepted
Coastal population	• We rejected the need for adjustment at final determinations. We retain this view based on the new evidence provided. • Southern Water's econometric approach to estimating its coastal cost adjustment claim is not robust. • Unit cost analysis is inconclusive on whether it costs more to operate and maintain coastal sewage treatment works than inland sewage treatment works, even after accounting for economies of scale at sewage treatment.	£126m	Not accepted
Gated allowance	• We do not consider Southern Water's new request for a capital maintenance gated allowance should be allowed. • The enhancing asset health understanding workstream provides a clear and certain route for additional base expenditure allowances where sector wide asset health issues are identified. • We are concerned about the maturity of Southern Water's asset management approach and asset deterioration modelling. • We can draw a clear distinction between the treatment of Thames Water through the asset health deficit conditional allowance and why this approach is not appropriate for Southern Water.	£500m	New request
Wessex Water			
Bioresources capital maintenance	• All evidence presented in the company's statement of case is new and was not included in the company's draft determination representation. [redacted] • We also consider that more information is needed from the company to demonstrate that the proposed costs are efficient.	£108m	Not accepted; all new evidence
Disinfection improvements	• This is a new cost adjustment claim. • We consider that additional information is required to assess the need for a cost adjustment, and the cost efficiency of requested costs. • We agree that the proposed investment is not funded through base expenditure allowances. • It is unclear why these proposed disinfection upgrades at water treatment works were not put	£47m	New request

	forward as part of the established industry DWI PR24 programme. • We suggest that Wessex Water follows due process for the assessment of these needs and associated requirements by engaging with the DWI in the first instance and agreeing to appropriate legal instruments. • If the investment is supported with legal instruments, and additional expenditure allowances are provided, it would be important to hold the company to account through a price control deliverable.		
South East Water			
Economies of scale at water treatment works	• We partially accepted the company's cost adjustment claim at final determinations. We retain this view based on the new information provided. • We accepted the unique circumstances faced by South East Water, Southern Water and Wessex Water in terms of number of sources per population (top three companies), meaning they could not benefit from economies of scale in water treatment. We also agreed this was unlikely to be captured by population density and water treatment complexity. • We developed an independent view of the value of the cost adjustment by including a water weighted average treatment size variable in all the water resource plus base cost models. • We only included the water weighted average treatment works size variable in the water resources plus models for the purpose of calculating the cost adjustment as this is where we expected the water-WATS variable to have the largest impact (ie it primarily affects water treatment costs).	£9.7m	Partially accepted

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1. Introduction

1.1 Our econometric base cost models are the starting point of our base cost assessment. They capture the key cost drivers that explain variations in efficient base expenditure between companies and over time.

1.2 But we recognise these may not capture all factors that drive differences in efficient costs. The cost adjustment claim process allowed companies to present evidence of unique operating circumstances, non-standard legal requirements or atypical expenditure which drive higher efficient costs for the company relative to its peers; or if the company did not consider that historical costs are a good reflection of future costs.

1.3 This document focuses on the following company specific cost adjustment claims submitted by the disputing companies:

- Anglian Water – Leakage
- Anglian Water – Boundary box replacements
- Anglian Water – Storage points and gravity sewers capital maintenance
- Northumbrian Water – Other capital maintenance (ie excluding mains renewals)
- Southern Water – Advanced anaerobic digestions upgrades
- Southern Water – Regional wage differentials
- Southern Water – Coastal population
- Southern Water – Gated capital maintenance allowance
- Wessex Water – Bioresources capital maintenance
- Wessex Water – Disinfection upgrades at water treatment works

1.4 This document should be read alongside our:

- Cross cutting expenditure allowances response to statement of cases document, which includes issues relating to our sector wide cost adjustments (mains renewals; meter renewals; network reinforcement; phosphorus removal; energy and net zero).[1]

- Asset health cross-cutting response to statement of cases document.[2]

[1] PR24 redeterminations – expenditure allowances – common issues
[2] PR24 redeterminations – expenditure allowances – addressing asset health

2. Anglian Water – Leakage

- Anglian Water submitted a cost adjustment claim worth £67.6 million for the additional costs it considers it faces to maintain leakage levels because of their leading position on leakage compared to other companies.
- We rejected the need for adjustment at final determinations. We retain this view based on the evidence provided in Anglian Water's Statement of Case.
- We consider it is not appropriate to consider the relationship between marginal costs of leakage reduction and leakage performance in isolation from total wholesale water base expenditure allowances. Analysis of the leakage cost data that we collected since PR19 does not provide compelling evidence to show that companies with low leakage levels incur higher leakage costs than companies with higher leakage levels.
- The conclusions of the PR19 redeterminations are no longer relevant since the empirical evidence has improved.

Our final determination

2.1 Anglian Water submitted a cost adjustment claim worth £67.6 million for the additional costs it considers it faces to maintain leakage levels because of their leading position on leakage compared to other companies.

2.2 Overall, we rejected the company's cost adjustment claim on the basis that the company did not provide compelling evidence to demonstrate the need for a cost adjustment, or that the requested costs are efficient.[3]

2.3 The company used three econometric approaches to estimate the required cost adjustment. The company's approach to calculating costs involved including leakage as a driver in the treated water distribution and wholesale water base cost models.

2.4 However, the leakage driver was not statistically significant in any of the models. This suggested that leakage performance is not a significant driver of treated water distribution base costs; or that existing explanatory variables, such as population density, already explain variations in leakage performance between companies.

2.5 In addition, our analysis of leakage cost data collected during PR19 did not provide compelling evidence to show that companies with lower levels of leakage (per property or length of mains) incur higher leakage costs (per property or length of mains).

[3] [OF-CA-222] Ofwat, Base cost adjustment claim feeder model – Anglian Water, December 2024

Issues raised by Anglian Water

2.6 Anglian Water refers to the PR19 redetermination, which stated that those companies performing better than the upper quartile on leakage are likely to be incurring more cost than will be reflected in the base cost models.

2.7 Anglian Water claims that Ofwat did not account for the higher marginal costs of leakage reduction incurred by companies delivering frontier performance on leakage. The company presents evidence showing that Anglian Water's marginal cost of leakage reduction has increased as the company's leakage performance has improved.[4]

2.8 Anglian Water also claims that the implicit leakage allowance from our base cost models is lower than Anglian Water's spending during AMP7. Anglian Water refers to analysis by consultants, Oxera, who used two conceptual approaches to estimate the implicit allowance for maintaining leakage performance. Both approaches show that implicit allowance is below actual spend in recent years.[5]

Our assessment

The conclusions of the PR19 redetermination are no longer relevant since the empirical evidence has improved

2.9 The PR19 redeterminations concluded that companies performing better than upper quartile are likely to incur more cost than reflected in the base cost models. The CMA applied an upwards adjustment to base costs for maintaining leading levels of leakage as the percentage of outperformance of industry upper quartile leakage level multiplied by the forecast leakage costs.

2.10 However, the assessment could not rely on a suitable set of industry level data on the cost to maintain and reduce leakage as no such information was available at the time. The CMA recommended that Ofwat collect more leakage data to allow the assessment of leakage costs in the future. We have done this since PR19. We collected data from water companies on the cost to maintain and reduce leakage and used this in our assessment of Anglian Water's claim at PR24.

It is incorrect to consider marginal costs of leakage reduction in isolation from total wholesale water base expenditure allowances

2.11 Anglian Water's argument focuses on the relationship between marginal costs of leakage reduction and leakage performance. On this basis, the company claims that companies delivering frontier leakage performance incur higher costs than companies that have higher levels of leakage. It also states that companies delivering frontier levels of

[4] [OF-OA-001] Anglian Water, Anglian Water PR24 CMA Redetermination Statement of Case, March 2025, p.59, para. 230
[5] [OF-OA-001] Anglian Water, Anglian Water PR24 CMA Redetermination Statement of Case, March 2025, p.65, para. 253

performance are likely to be incurring greater cost than allowed through the base cost models.

2.12 Anglian Water's evidence suggests that, for a given company, increased leakage performance results in higher marginal cost of maintaining that level of leakage or reducing leakage further increases.

2.13 We consider this does not provide compelling evidence of a need for adjustment. A company's cost may increase with its level of performance. However, the key question we need to determine if there is a need for adjustment is whether the allowance from the base cost models provides sufficient allowances to allow leading leakage performing companies to maintain low leakage levels.

2.14 Our base cost models set allowances by benchmarking company costs over time but also between companies. Even if a company with lower levels of leakage may face increasing marginal costs for incremental improvements to reduce or maintain leakage, another company with higher levels of leakage may face higher average leakage unit costs (calculated per property or length of mains) due to the need to fix more leaks. As a result, poor leakage performers may face higher leakage unit costs than good leakage performers.

We do not find compelling evidence to show that companies with low leakage levels incur higher leakage costs than companies with higher leakage levels

2.15 To assess the need for a cost adjustment we compared leakage levels, normalised per property or per kilometre of mains, against leakage unit costs (per property or length of mains) across all companies.[6] The results are shown in the graphs below.

2.16 Anglian Water's leakage expenditure is not the highest in the industry per km of mains or property. In terms of leakage expenditure per property, Anglian Water's average unit costs are the fifth highest in the industry. If considering leakage costs per length of mains, Anglian Water's average unit costs rank even lower.

2.17 This analysis also indicates that other companies, especially Bristol Water and SES Water, are delivering low levels of leakage, similar to Anglian Water's when normalised by number of properties, but are incurring lower average leakage costs per property.

2.18 Therefore, we consider that the leakage cost and performance data does not provide compelling evidence to show that companies with lower levels of leakage (per property or length of mains) incur higher leakage costs (per property or length of mains) than companies with higher levels of leakage.

[6] We used total leakage expenditure, including maintain leakage expenditure and reduce leakage expenditure, to mitigate for cost allocation issues. But the findings still hold when only looking at maintain leakage spend. We took the average unit cost and average leakage level (per property and length of mains) for each company across the seven years of leakage data available.

Figure 1: Leakage spend per property vs leakage levels per property

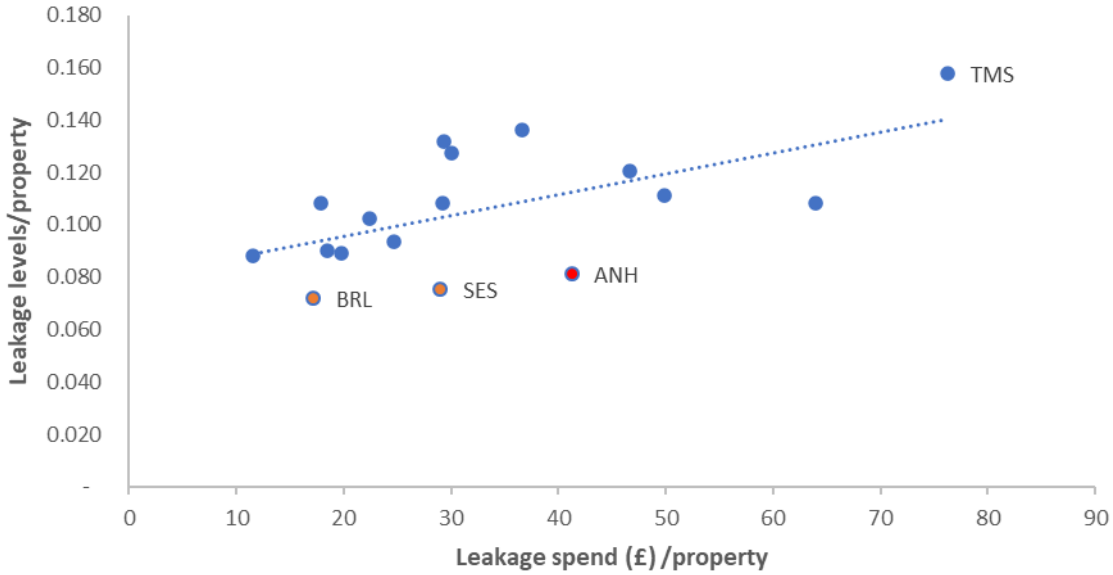
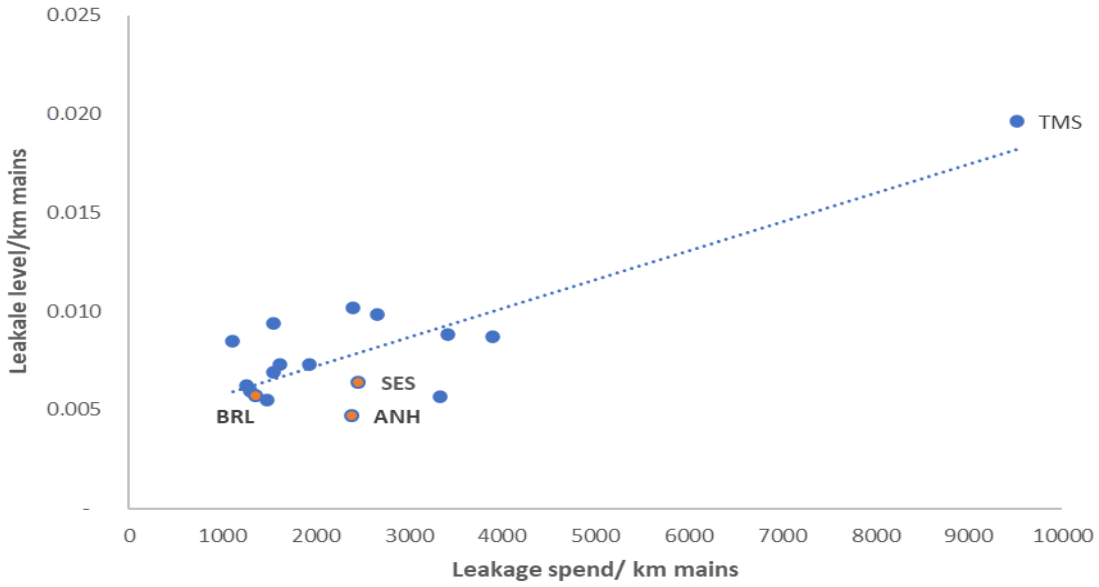


Figure 2: Leakage spend per kilometre of main vs leakage levels per length of main



Econometric analysis suggests that leakage performance is not a significant driver of base costs, or is already explained by the base cost drivers

2.19 We tested the inclusion of leakage per property, and leakage per length of main, as a variable in the base cost models. The results showed that the leakage variables are not statistically significant (with very high p-values) and, in most cases, the coefficient on the leakage variable is positive suggesting that base costs increase with leakage levels.

2.20 We also estimated an indicative implicit base cost allowance for leakage by regressing historical leakage costs on the set of variables included in the treated water distribution base cost models. The model was run over the period for which leakage cost data is

available (2017/18 - 2023/24). To support the company's claim, we would expect that the predicted leakage costs from this model, which uses the same variables as our base cost models, would be lower than the actual leakage costs incurred by Anglian Water if higher leakage performance leads to higher leakage costs. Our analysis found the opposite. Predicted leakage costs for Anglian Water over the sample period, using this econometric model, were higher than actual leakage spend reported by the company. This suggested that the base cost models provide sufficient allowances to companies with low levels of leakage to maintain that level of performance.

2.21 In addition, Anglian Water recognize themselves that leakage levels are influenced by a range of exogenous factors, such as population density, soil type, meter penetration, pipe material and rainfall. Most of these factors are outside management control. In their Business Plan cost adjustment claim submission, Anglian Water presented an econometric model which they claimed showed that much of the variation in leakage "can be explained by regional characteristics". Furthermore, Anglian Water stated that "this result indicates how initial leakage levels are largely outside of company control".[7] This raises the question of whether Anglian Water's performance on leakage can be attributed to company efforts (which results in higher costs) or to exogenous factors. A company with higher 'starting levels' of leakage or facing more adverse external factors may need to spend more than Anglian Water to achieve the same leakage performance.

2.22 The relationship between quality of service (or company performance) and costs has been examined by other regulators, most recently by Ofgem in the RIIO-ED2 price control determination. Ofgem noted that "the cost-quality relationship was highly complex to quantify. Low quality may be associated with low cost (ie it is cheaper to deliver low quality), if, for example, low quality entails installing lower cost equipment and employing fewer resources for engaging with customers. However, it is also possible that low quality ends up leading to higher costs, if it ends up triggering costly repairs and significant customer engagement."[8] Ofgem decided not to implement any pre-, within-, or post-modelling adjustments to account for any perceived funding gap associated with the link between quality of service and costs. This was because:

- There are significant challenges and complexities associated with integrating quality of service within the cost assessment process.
- There is a lack of sufficiently robust data to determine if the historical and forecast company costs are consistent with performance targets.
- Any adjustment to forecast modelled costs would rely on the assumption that the company receiving the adjustment will continue to deliver leading levels of performance.

2.23 Ofgem's approach was supported by most Distribution Network Operators (DNOs).[9]

[7] [OF-CA-246] Anglian-Water, ANH23-Cost-Adjustment-Claims, October 2023, p.95
[8] [OF-CA-225] Ofgem, RIIO-ED2 Final Determinations Core Methodology Document, December 2022, p.343, para. 7.567
[9] [OF-CA-225] Ofgem, RIIO-ED2 Final Determinations Core Methodology Document, December 2022, p.344, para. 7.572

2.24 Taking all the factors described above into consideration, we remain of the view that the company did not provide compelling evidence to demonstrate the need for a cost adjustment, or that the requested costs are efficient.

3. Anglian Water – Boundary box replacements

- Anglian Water requested an adjustment to its wholesale water base allowance of £138 million to enable the company to deliver its boundary box replacement programme.
- We rejected the need for adjustment at final determinations. We retain this view based on the new evidence provided by the company in its statement of case.
- The company provides limited evidence to justify its assumptions on the need for replacement of boundary boxes.
- The company does not take into account the scope for efficiency between its meter and boundary box replacement programmes.
- The company does not provide any additional evidence to demonstrate the efficiency of its costs
- We intend to collect data on boundary boxes as part of our enhancing asset health workstream.

Our final determination

3.1 In its draft determinations representations, Anglian Water requested an adjustment to its wholesale water base allowance of £138 million to enable the company to deliver its boundary box replacement programme.

3.2 We rejected the cost adjustment claim for the following reasons:[10]

- Anglian Water received a £119 million adjustment to its base expenditure allowance to enable timely and efficient delivery of its meter replacement programme.
- High uncertainty relating to the number of required boundary box replacements, and how many age driven replacements had already been undertaken.
- We considered there to be scope for efficiency between the company's meter replacement and boundary box replacement programmes.
- The company did not provide evidence on the efficiency of its unit cost, or evidence of external benchmarking to support its case.
- Risk of perverse incentives to replace boundary boxes that do not require replacement.
- The company did not provide compelling or robust evidence to justify the associated leakage benefits.

[10] [OF-CA-222] Ofwat, Base cost adjustment claims feeder models – Anglian Water, December 2024, CAC3. See for our complete assessment

Issues raised by Anglian Water

3.3 Anglian Water states that our assessment is based on flawed assumptions as to how boundary box replacements can be delivered.[11] The company states that its boundary box and meter replacement work cannot be effectively combined, stating that these require different resources (including time, skillset, equipment).

3.4 The company states that it is not sufficiently funded in the round. It states that the costs associated with past replacements are not reflected in our base models, and have instead been funded by reallocating funding within its totex envelope.

3.5 The company reasserts that its request is efficient, but does not provide any additional evidence beyond what was included in its original proposal.[12]

Our assessment

The company provides limited evidence to justify its assumptions on the need for replacement

3.6 In our final determination, we raised concerns over uncertainty of the company's forecast replacement, and the extent to which the required replacements had already been undertaken.[13] In its statement of case, Anglian Water provides additional evidence to demonstrate its increasing meter penetration since 1990, highlighting the installation of 447,000 meters during the 1995-2000 period.[14] Based on the average asset life assumed by Anglian Water, these are the boundary boxes that are likely to require replacement during 2025-30.

3.7 While this helps provide the context for the company's position, it does not add any depth to the assumptions that the claim is based on. The company uses age as the determining factor for rolling out a growing boundary box replacement programme. However, it is widely acknowledged that age is just one factor that is important when considering the need for replacement, and that often assets can provide the functionality required well beyond the average expected asset life. For example, many Victorian brick built sewers are still operating well despite being over 100 years old.

3.8 The company does not provide evidence to justify its assumptions on asset age, or how this has driven past replacements, noting the increase over the past two regulatory periods. For example, the company does not reflect on:

- What was the average age of the boundary boxes replaced;
- What was the condition of the boxes replaced and the reasons for deterioration (for example, ground movement, weather exposure);

[11] [OF-CA-001] Anglian Water, Statement of Case, March 2025, p.69, paragraph 268
[12] [OF-CA-223] Anglian Water, ANH_DD_009-Boundary-box-CAC, August 2024
[13] Anglian Water reports replacing 188,991 boundary boxes over the 2015-25 period.
[14] [OF-CA-224] Anglian Water, Annex 008 – Anglian, Metering Graphs and Statistics Since Privatisation, March 2025

- What proportion of previous replacements were driven by the above; and
- The associated reduction in leakage. For example, modern boundary boxes may be designed to improve leak detection capabilities.

3.9 Without evidence of the extent of these impacts, there is no assurance that the company needs to have a proactive boundary box replacement programme due to aging assets, or whether that is the best option for customers.

We consider there is still scope for efficiency between the company's meter and boundary box replacement programmes

3.10 The company states that its boundary box and meter replacement programmes cannot be effectively combined in any meaningful way. It includes an illustrative example of what a simple meter replacement in comparison to a boundary box replacement to demonstrate this.[15]

3.11 While we find this useful to see, we do not consider this to be compelling evidence that the two programmes cannot be combined in any way or that there are not opportunities for efficiency between the two.

3.12 To use a simple example, the company states that a boundary box replacement can include multiple visits to a site, including a first assessment of whether the box requires replacement. All of which will come at a cost to the customer. We consider the company could give thought as to how it can create synergies between the two programmes. For example, whether engineers undertaking the meter replacement could undertake a visual condition inspection to help determine whether a replacement is required. We expect considering such options could help to reduce the costs of running both programmes, and therefore the costs incurred by customers.

3.13 It is also important to consider allowances in the round when assessing the need for an adjustment. Despite forecasting to replace more than one million meters over the 2025-30 period, Anglian Water did not submit a meter replacement cost adjustment claim at PR24. Nevertheless, we allowed an additional £119 million to the company through our meter replacement sector wide adjustment to help facilitate timely and efficient delivery of its programme.[16] [17] This included an allowance for meter replacements delivered through accelerated and transition expenditure in the last two years of the 2020-25 period. We note that the company's base expenditure allowance at final determinations was more than it requested in its October 2023 business plan.

3.14 Our analysis indicates that the additional allowances provided through this adjustment could fund the company's meter replacement programme in its entirety, with potential excess allowances.[18] The company fails to acknowledge this in its cost adjustment claim and

[15] [OF-CA-001] Anglian Water, Statement of Case, March 2025, p.69, figures 22 and 23
[16] [OF-OA-022] Ofwat, PR24 final determinations: Expenditure allowances, December 2024, pp.39-42, section 2.2.2
[17] [OF-CA-226] Ofwat, PR24 FD CA99 Meter renewals cost adjustment model, December 2024.
[18] Our analysis is informed by the number of forecast replacements and the unit rate of replacements provided by Anglian Water in response to OFW-REP-ANH-064, [OF-CA-228].

statement of case, or the potential for efficiencies it can make in the running of its programme(s) and the costs incurred.

The company does not provide any additional evidence to demonstrate the efficiency of its costs

3.15 The concerns we raised in the final determination around cost efficiency remain. The proposal is based on supplier costs, assuming a mix of works. The company does not provide any additional evidence in its statement of case to demonstrate how it has satisfied itself that these costs are efficient, or how it has challenged these costs to deliver a best value solution for its customers.

3.16 We consider this particularly pertinent given the reactive nature of the replacement programme, which means there is no certainty over the mix of work and costs that the company will face.

3.17 By way of example, Southern Water reported a unit cost of £634 per boundary box replacement in its proposed uncertainty mechanism.[19] It also accounted for any cost savings from our assumed unit cost of meter replacement in its assessment and estimated cost.

3.18 In addition, we collected some cost information on boundary boxes through the PR24 query process. This included the cost of the boundary box itself, and the cost of replacing a meter at the same time as a boundary box replacement. The average unit cost of replacing a meter and a boundary box at the same time was approximately £443 per replacement.[20] Based on this evidence, the company's proposed unit cost of replacement appear expensive (£649.45).[21] The company provides little evidence or assurance that it is not.

3.19 Moreover, we consider that allowing this unit cost without evidence of its efficiency, and uncertainty over the scope and scale of the programme, creates a perverse incentive for the company to undertake a replacement, even if not required. This will lead to customers overpaying. This uncertainty inhibits the ability to hold the company to account and ensure that the right boxes are replaced, and the company does not opt for replacing cheaper and potentially unnecessary boxes to avoid returning money to customers.

We intend to collect data on boundary boxes as part of our enhancing asset health workstream

3.20 The company states that the requirement to replace boundary boxes will continue to increase over time as it starts to impact more companies.

[19] [OF-CA-227] Southern Water, Draft Determination Response Document, p.100.
[20] We collected this information from four high meter penetration/high replacement rate companies: Anglian Water, Severn Trent Water, South West Water and South East Water. We requested this information from Southern Water but it could not provide evidence of its historical costs associated with boundary box replacement.
[21] [OF-OA-001] Anglian Water, Statement of Case, March 2025, p.70, paragraph 272(ii).

3.21 We intend to collect more information from companies on boundary box replacements ahead of PR29. This will include installation data, replacement rates, and associated costs. We will collect this as part of our forward planning for PR29, which is discussed further in our asset health appendix. We note that we do not recollect boundary box replacements being raised by any company through the Cost Assessment Working Group ahead of business plan submissions.

4. Anglian Water – Storage points and gravity sewers capital maintenance

Anglian Water have submitted a new cost adjustment claim worth £150 million for storage points and gravity sewers capital maintenance. This evidence has also been submitted as part of the enhancing asset health workstream. We do not consider this adjustment is appropriate for the reasons set out below:

- The company has not determined what base buys so it is not possible to ascertain what should be delivered through the existing base allowance to prevent customers paying twice.
- The company has not included outputs relating to the investment request, and has not presented evidence to demonstrate the need for a cost adjustment.
- We do not consider a use-it-or-lose-it allowance is appropriate. It would not consider what the company should deliver with existing base expenditure allowances, which may lead to customers paying twice. And it does not guarantee improved customer and environmental outcomes from the investment.
- The company has previously proposed that this investment can be delayed until AMP9 within its business plan and did not put forward a case in its draft determination representation.
- The enhancing asset health understanding workstream provides a clear and certain route for additional base expenditure allowances where sector wide asset health issues are identified. For example, a need to move towards a more sustainable renewal rate.

4.1 Anglian Water has requested a new £150 million cost adjustment for storage points and gravity sewers subject to a use it or lose it allowance[22]. The company considers this will address its perceived asset health risks for these asset classes created by the base cost pressures in the final determination.

4.2 Anglian Water states that it only requests this cost adjustment if the potential issues it has identified in relation to mains renewals cost adjustment claim, leakage cost adjustment claim, boundary box replacement cost adjustment claim, and frontier shift are not addressed by the CMA.

[22] [OF-OA-001] Anglian Water, Statement of Case, March 2025, p.53

Issues raised by Anglian Water

4.3 Storage points refer to locations where materials or assets are stored before being moved to their next destination. Storage points can include water towers, service reservoirs, and other similar structures.

4.4 Gravity sewers are underground piping systems that use the force of gravity to transport sewage or surface runoff away from the source and towards the destination.

4.5 Anglian Water proposes the following:[23]

4.6 For storage points the company states that these are aging assets with deteriorating asset health necessitating higher spend to maintain these assets. The company states the scale of refurbishment is becoming more significant as the short-term repair strategies have been exhausted. Anglian Water has identified the need for an additional £60 million of funding to improve water quality and reduce the risk of supply restrictions to c. 305,000 properties[24].

4.7 For gravity sewers Anglian Water states the maintenance is becoming increasingly reactive as there is no headroom in existing allowances to carry out proactive replacement work. Anglian Water is proposing a targeted increase in maintenance of assets in high groundwater areas of around £90 million to cover inspection of critical sections, relining of around 110km and replacement of around 18km[25].

4.8 The company states that the ongoing work through the Asset Health Roadmap workstream does not mitigate the underfunding risks and there is little confidence that this will deliver additional allowances required.

Our assessment

4.9 The overall proposal is incomplete, insufficiently evidenced and would have failed the cost adjustment claim criteria[26].

4.10 We would expect that companies should maintain a certain number of storage points and gravity sewers, either through refurbishment or replacement, with their base allowances. Therefore, companies should determine what capital maintenance can be delivered through base allowances before requesting a cost adjustment. We refer to this as "what base buys".

4.11 The company has not included an estimation of 'what base buys'. This makes it challenging to assess the need for a cost adjustment. We expect companies to demonstrate that the base cost allowance would be insufficient to accommodate these unique circumstances

[23] [OF-OA-001] Anglian Water, Statement of Case, March 2025, pp. 74-76, para. 302
[24] [OF-CA-038] Anglian Water, Statement of Case - Annex 013, March 2025
[25] [OF-OA-001] Anglian Water, Statement of Case, March 2025, p.76, para. 302
[26] [OF-OA-022] Ofwat, PR24 final determinations: Expenditure allowances, December 2024, p.28

without the claim. Cost adjustments should only be provided for capital maintenance requirements that go above 'what base buys'. Otherwise customers will pay twice.

4.12 The company has not included measurable outputs that would enable the tracking of delivery. The company has not included sufficient evidence that the cost estimates are efficient or explained how they have arrived at the estimated costs.

4.13 We disagree with the proposal to include a use it or lose it allowance. It would be challenging to determine what the 'use-it-or-lose-it' allowance would be given the absence of robust asset condition and workload information. For similar reasons, it would be difficult to hold companies to account and protect customers from under delivery. Without identified outputs of investment, we cannot hold companies to account through a price control deliverable mechanism. This risks customers paying for investment that does not lead to improvements in long-term asset health. Historically there is evidence that Anglian Water has not delivered investment solely as a result of receiving an allowance reiterating the need for a direct link to either a performance commitment or PCD. Within Anglian Water's PR19 business plan, the company forecast 0.18% per year of mains renewals, however the outturn data shows the company only delivered an average of 0.08% per year of mains renewals[27]. Therefore, we consider PCDs are an important mechanism to help companies rebuild trust with customers.

4.14 It is not clear why this cost adjustment is only now being proposed instead of in previous business plan submissions. In its October 2023 business plan submission, Anglian Water suggested that it would seek further investment for these asset groups from AMP9 onwards at PR29[28]. The company highlighted that these asset groups need additional investment to mitigate the increasing risk of asset failures. It stated that it would increase base expenditure (through reallocation from other areas) on storage points during 2025-2030 and would seek to secure further allowances at PR29 to increase this to £14 million a year in AMP9. For gravity sewers it states that operational strategies will maximise use of existing maintenance budgets, but that it needs to increase replacement rates from AMP9.

4.15 This raises the question of why an additional £150 million is needed now given the company considered it was appropriate to delay this investment when it submitted its business plan in October 2023 and also did not propose an increase in its August 2024 draft determination representations. Anglian Water have an average renewal rate over the PR19 period for gravity sewers of 0.06%. This is compared with the forecast 0.11% included in their PR19 business plan[29]. This also raises concerns that the company has not delivered historically.

4.16 Through the enhancing asset health understanding workstream[30] we will be collecting robust and comparable data to determine whether further sector-wide cost adjustments are needed to increase levels of refurbishment and renewals and improve asset condition. We aim to reach decisions on whether additional allowances are needed ahead of the 2027-28 financial year for high priority assets, with further adjustments considered at PR29.

[27] [OF-CA-051] Ofwat, Asset renewals plots, April 2025.
[28] [OF-CA-053] Anglian Water, Business plan ASRAP, October 2023, p49.
[29] [OF-CA-051] Ofwat, Asset renewals plots, April 2025.
[30] [OF-CA-011] Ofwat, Enhancing Asset Health Understanding Workstream

Anglian Water and other companies have identified storage points and sewers as a priority for enhancing asset health understanding. We intend to publish a progress note in Spring 2025, which sets out the outcome of our asset prioritization exercise. We are confident this workstream will enhance asset health understanding of storage assets and sewers, and allow us to reach an informed decision on whether a step-change in asset renewals and refurbishment is needed to improve asset condition, while ensuring that customers do not pay twice.

4.17 Assessing asset condition at the sector level through the enhancing asset health understanding workstream ensures that decisions are underpinned by robust data and all companies are treated equally. It also reduces the risk of allowing cost adjustments just because the company has not maintained their assets appropriately. The latter is more likely if individual company cost adjustments to increase capital maintenance are assessed in isolation from other companies.

4.18 The lack of confidence Anglian Water has for the enhancing asset health understanding workstream contrasts with the support it has shown to date through active participation in workshops and bilateral discussions to allow swift progress to be made.

4.19 We do not consider the CMA should assess this cost adjustment request for storage points and gravity sewers through the redeterminations process. The asset health workstream provides a more efficient and effective route for these assets to be considered across the sector, given the buy in and engagement of other companies and wider stakeholders.

5. Northumbrian Water – Other capital maintenance

Northumbrian Water has provided additional evidence on its capital maintenance cost adjustment claim. We have reviewed the additional information and retain the view that the company has not provided compelling evidence to demonstrate the need for adjustment or that proposed costs are efficient for the following reasons:

- The company has not set out a sensible view of what base buys. So, it is not possible to ascertain what should be delivered through existing base allowances to prevent customers paying twice.
- Historic base allowances have been sufficient and Northumbrian Water has underspent these allowances. Our base expenditure allowances are sufficient and the work proposed in the request should be delivered through these allowances.
- The scope of the proposal has changed significantly since final determination raising questions about the investment included. There is large variance in the costs included and only a small proportion are benchmarked.
- The company has included poorly evidenced outputs relating to the investment.
- The enhancing asset health understanding workstream provides a clear and certain route for additional base expenditure allowances where sector wide asset health issues are identified. For example, a need to move towards a more sustainable renewal rate.

Our final determination

5.1 Northumbrian Water proposed a cost adjustment claim in its business plan requesting a step up in non-infrastructure capital maintenance expenditure over the 2025-30 period. The claim was to remediate condition grade four or five assets to condition grade two or better in a "spend to save" argument.

5.2 The company initially submitted this claim in one of its enhancement free form lines. We reallocated this request to base expenditure to assess as a base cost adjustment claim against the cost adjustment claim assessment criteria. We made the reallocation because the request for increased capital maintenance spend is related to activities that are funded through base allowances.

5.3 At draft determination the total value of the claim was £112.2 million split between water network plus (£17.8 million) and wastewater network plus (£94.4 million). In its draft determination representation, the company increased its request to £189.3 million split

between water network plus (£65.7 million) and wastewater network plus (£123.6 million). We did not allow this cost adjustment claim in our final determination[31].

5.4 We did not allow the cost adjustment claim for the following reasons:

- Absence of clear outputs that will be delivered with the cost adjustment.
- Risk of customers paying twice and discouraging the sector from delivering renewals with base expenditure allowances.
- The forecast increase in capital maintenance expenditure was driven by factors inside of company control.
- The company did not provide compelling evidence to demonstrate efficient use of base expenditure allowances.
- We did not consider the company provided compelling evidence that its proposed cost adjustment is efficient.
- We considered that Northumbrian Water's base expenditure allowance at final determination was sufficient for it to deliver the capital maintenance included in its cost adjustment claims.

Issues raised by Northumbrian Water

5.5 Northumbrian Water has challenged our final determination decision across a number of areas that are set out below:

- Issue 1 - demonstrating the need for adjustment;
- Issue 2 - customers should not pay twice;
- Issue 3 - efficient investment of historical base allowances;
- Issue 4 - cost efficiency;
- Issue 5 – the absence of clear outputs; and
- Issue 6 - risk of delaying this investment.

5.6 The company has set out an updated investment case based on additional work undertaken. The company is now proposing an investment case for civil structures and service reservoirs, totaling £179.54 million. This comprises of £56.16 million for water civil structures, £75.59 million for wastewater civil structures and £47.79 million for service reservoirs. [32] [33] This proposal represents a significant change from Northumbrian Water's draft determination representation request which had a much larger focus on the wastewater assets as set out in the earlier paragraph 6.3.

[31] [OF-CA-054] Ofwat, Northumrbian Water base cost adjustment claim feeder model, December 2024, NES_CAC1, NES_CAC2
[32] [OF-OA-002] Northumbrian Water, Statement of Case, March 2025, p.89, para. 308
[33] [OF-CA-056] Northumbrian Water, Statement of Case – Appendix 2, March 2025

Issue 1 – Demonstrating the need for adjustment

Our final determination

5.7 Northumbrian Water did not provide compelling evidence to demonstrate the need for adjustment.[34]

Issues raised by Northumbrian Water

5.8 Northumbrian Water states that the work proposed in its investment case needs to be delivered in the 2025-30 period. The company states that we did not challenge or reject the need for undertaking the proposed programme of work, but instead considered an adjustment to the company's base cost allowance was not needed.[35]

5.9 Northumbrian Water has submitted new evidence in its statement of case, including a list of schemes, and further evidence relating to the deterioration modelling that has been undertaken. [36][37]

Our assessment

Northumbrian Water has provided additional information on the scope of its proposed investment to demonstrate the need for adjustment. We have concerns about the robustness of its evidence.

5.10 To evidence the need for an adjustment, companies must demonstrate that the proposed investment is driven by factors that are unique to the company and/or are outside of company control (eg sector wide forward looking cost pressures). It must also demonstrate it has invested its allowances efficiently historically, and has satisfied itself that its customers will not be paying twice.[38] At final determination, the company did not provide compelling evidence to demonstrate that its proposal met this criteria.

5.11 One of the issues with the company's claim in its draft determination representations was the lack of clarity on what it would deliver over the period with the proposed adjustment. In its statement of case, the company has sought to strengthen its evidence to demonstrate the need for adjustment, including a proposed list of schemes it will undertake with its requested adjustment.[39] However, based on the description of the condition of assets in this list, in many cases, it is not clear that an action needs to be carried out.

5.12 The evidence provided sets out the asset name and a brief statement of the condition of the asset. It includes 74 water and 291 wastewater asset health schemes. For at least 45 of

[34] [OF-CA-054] Ofwat, Northumrbian Water base cost adjustment claim feeder model, December 2024, NES_CAC1, NES_CAC2
[35] [OF-OA-002] Northumbrian Water, Statement of Case, March 2025, pp. 90, para. 312
[36] [OF-CA-057] Northumbrian Water, SOC010 – PCD civil structures, March 2025.
[37] [OF-CA-058] Northumbrian Water, SOC613 – Deterioration modelling, March 2025.
[38] [OF-CA-001] Ofwat, Creating tomorrow, together: Our final methodology for PR24: Appendix 9 Setting expenditure allowances, December 2022, pp.156-159
[39] [OF-CA-057] Northumbrian Water, SOC010 – PCD civil structures, March 2025.

these schemes, it is not clear that investment in the civil assets is needed for the following reasons:

- **The description states that it is unsure whether there is an investment need and further investigation is needed.** For example, "Mineral deposition at base of tank potentially indicating leakage. Further investigation needed."
- **The root cause of the issue remains unknown.** For example, "Sump is overtopping and cascading down the concrete steps flooding the gallery walkway, asset needs investigating and resolving."
- **It is not clear whether it is a historic issue that has already been addressed.** For example, "Historic water ingress through roof and roof/wall interface causing staining."
- **The issue has been caused by a defect in construction, and therefore customers may pay twice.** For example, "There is one large, continuous crack around the perimeter of the tank at around 750mm from ground level and which appears to be actively leaking. This may be the result of a defect in the construction process."
- **The issue raised relates to vermin activity and no work is required to the civil asset.** For example, "A small portal frame with blockwork and cladding infill. The building is open at one end allowing vermin activity and the interior of the building appears to have an excess of bird excrement, both of which pose a H&S risk to Operators."
- **The asset is abandoned.** For example, "Sludge tank is an above ground in-situ concrete structure with external steel cladding. The concrete haunching was lifting off and there was leaking at the overflow. The asset has been abandoned."
- **The risk to service is not clear.** For example, "Brick and Concrete structure. Some vertical cracking and staining but still assumed watertight.[40]

5.13 Furthermore, many of the asset condition descriptions state the presence of concrete spalling, cracking, or corroded reinforcement. On its own, this does not indicate the need for significant investment now. A report published by UKWIR sets out the alignment of failure modes and condition-based limit states, the point at which a decision on an intervention should be made.[41] The presence of concrete spalling, surface cracking and corroded reinforcement in a concrete structure is Limit State 1, in table 4.8 of UKWIR's report. As per table 4.8 (figure 3) and table 7.2 (figure 4) of UKWIR's report, this is identified as having no expected impact on service and only minor cost impact from increased inspection or minor concrete repair.

5.14 All of the above examples go against our principles for applying an adjustment, and do not indicate good asset management practice. Before requesting an adjustment, we expect companies to understand the issues it considers it needs to address, and why it does not consider its modelled base allowance is sufficient to do so. For example, undertaking root cause on asset failures to understand what is driving the issue, what the right solution is, and whether the cause of the issue risks customers paying twice, such as construction defects. The additional evidence provided by the company indicates that it has not thought through its proposal in sufficient detail.

[40] [OF-CA-057] Northumbrian Water, SOC010 – PCD civil structures, March 2025.
[41] [OF-CA-059] UKWIR, Deterioration rates report.

Figure 33: UKWIR report limit state table

Asset	Failure Mode	Limit State	Functional Limit State	Cost/service impact
Concrete structures	Concrete spalling/surface damage/initiation of corrosion of reinforcement	LS1	Carbonation model: carbonation front reaches reinforcement Chloride model: 0.4% chloride at reinforcement	No impact on service expected. Minor cost impact arising from increased repair activity and monitoring
	Initiation of cracking of reinforcement	LS2	Carbonation model: micro-cracking in reinforcement bar (depends upon bar size and strength) Chloride model: 1.0% chloride at reinforcement OR micro-cracking in reinforcement bar (depends upon bar size and strength) Sulphate model: 15 % section loss (of concrete member)	Possible moderate impact on service in view of potential necessity of taking asset out of service for repair (degree depends upon asset type and contingency measures) Moderate impact on cost arising from scope of repair (moderate) and introduction of measures instigated to ensure service levels are maintained
	Section loss to structural distress Structural collapse	LS3	Carbonation model: 30% section loss of reinforcement Chloride model: 30% section loss of reinforcement Sulphate model: 30 % section loss (of concrete member)	Possibly severe impact on service, particularly if asset fails unexpectedly. Cost impact will be high due to asset refurbishment/replacement with potential additional costs arising from penalties/fines (due to pollution, service loss, compensation) and the introduction of measures to restore and maintain services (during aftermath of failure before asset reinstated)

Figure 44: UKWIR report consequence level table

Degree of failure	Consequence level		
	Low Consequence	Medium Consequence	High Consequence
None	Continue inspection	Continue inspection	Continue inspection
Minor (LS1)	Continue inspection	Increase inspection	Increase inspection
Medium (LS2)	Increase inspection	Repair	Repair (urgent)
Severe (LS3)	Repair	Replace	Replace (urgent)

* Note exact intervention type may depend upon other broader factors, e.g.:

- synergies within investment programmes
- additional drivers (e.g. Supply/Demand/Quality)
- obsolescence

We have concerns about the robustness of the assumptions underpinning the company's proposal and deterioration modelling

5.15 The company tries to demonstrate that investing in repairing assets now will help it to avoid replacement costs in future. It states that it has 10 years from the start of the propagation phase to repair the asset, after which it can only replace the asset.[42]

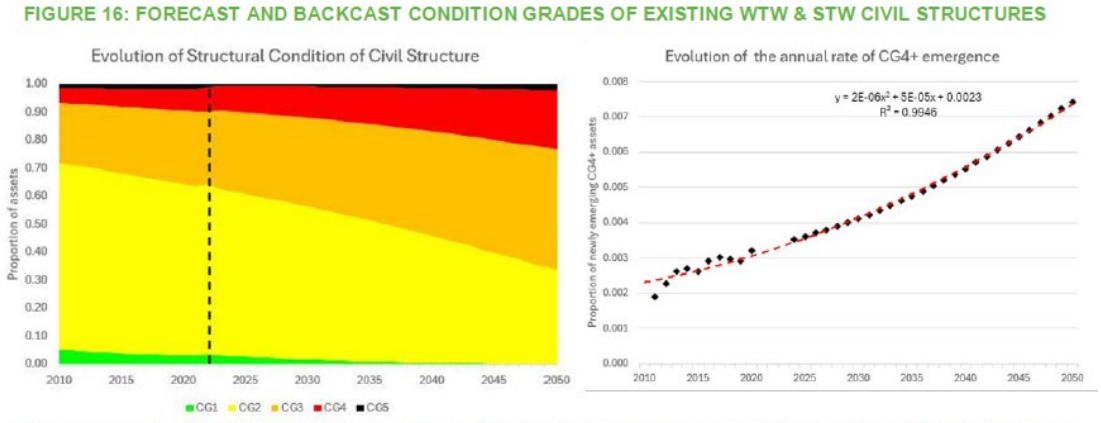
5.16 Its calculation is based on having an allowable corrosion loss on a 12mm reinforced concrete bar of 1.5mm per side, and a typical corrosion rate of 0.15mm/year, resulting in the 10 year period.[43]

5.17 The corrosion rate that Northumbrian Water has used is for corrosivity category C5, very high (marine/industrial). This is for "offshore areas of high salinity" or "buildings with permanent condensation and high pollution.[44] The company uses this calculation as the basis for the need for repair for four clarifiers at Lartington WTW at a cost of £5.16 million and three PSTs at Birkley STW at a cost of £786k within the next 10 years.

5.18 A more appropriate category of corrosivity for treatment works sites would be C4 high (chemical plants, swimming pools, coastal ship and boatyards) or C3 medium (production rooms with high humidity and some air pollution, eg food processing plants, breweries, laundries and dairies). These have lower corrosion rates of 0.08mm/year and 0.05mm/year respectively. Under this more appropriate categorisation, the time to repair the asset increases from 10 years to 18-30 years from the start of propagation phase.

5.19 Northumbrian Water has also developed deterioration modelling. It states that its models show that the number of assets entering condition grade 4 and 5 is increasing above what has been observed historically.[45]

Figure 5: Northumbrian Water deterioration modelling outputs



Source: Civil Deterioration Modelling, SOC613, and Aqua Consultants, Email on the consequences of civil structure failures (09 March 2025) (Aqua Consequences of Civil Structure Failures Email), 09 March 2025, SOC610

5.20 The deterioration model is based on asset inspections in 2022-2023, combined with the year the asset was installed. This indicates that the company has not been collecting data on the condition of their assets over time, and therefore may not have had a good understanding of

[42] [OF-CA-056] Northumbrian Water, Statement of Case – Appendix 2, March 2025, p.27, para. 102-105.
[43] [OF-CA-056] Northumbrian Water, Statement of case – Appendix 2, March 2025.
[44] [OF-CA-158] Galvanizers association, Corrosion protection
[45] [OF-CA-056] Northumbrian Water, Statement of Case – Appendix 2, March 2025, p.27, para. 102-105

its assets. The deterioration model has several limitations, many of which it acknowledges in its accompanying report, SOC613 Civil Deterioration Modelling. We discuss these below.

5.21 Firstly, the deterioration model is built using a single inspection at each asset in 2022-2023, rather than tracking the cohort of assets over time. The deterioration analysis is therefore sensitive to inaccuracies in year of construction, for which no evidence of assurance has been provided.

5.22 Secondly, the deterioration analysis is sensitive to the sample of asset used, and the company's operating conditions and maintenance history (or absence of maintenance). No evidence has been provided on how the sample of assets was selected.

5.23 Finally, the model does not show good correlation with the observed data, particularly for concrete sewage treatment works, the most common asset type, where the model overpredicts the proportion of treatment works asset at condition grades 4 and 5 (red)[46].

Figure 65: Northumbrian Water deterioration model outputs[47]

Issue 2 – Customers should not pay twice for investment

Our final determination

5.24 Northumbrian Water did not arrive at a reasonable or realistic view of 'what base buys' and focused this on its internal cost data only. This increases the risk that customers pay twice if we had allowed the cost adjustment, once through base cost model allowances and again through the proposed cost adjustment.

[46] Ofwat, PR24 redeterminations – expenditure allowances – addressing asset health, April 2025, p.18
[47] [OF-CA-058] Northumbrian Water, SOC613 – Deterioration modelling, March 2025

5.25 This is pertinent as Northumbrian Water's proposal focused on the replacement / refurbishment of many small assets in condition grade 4 and 5, ie assets in poorest condition. But it did not provide compelling evidence for why these asset condition issues have not already been addressed through its historical base allowances.

5.26 Accepting Northumbrian Water's proposal would have discouraged all water companies from renewing and maintaining their assets with base expenditure allowances going forward.[48]

Issues raised by Northumbrian Water

5.27 Northumbrian Water states that not having access to sector-wide data is justification for using internal cost data to calculate what base buys. The company states that it is unreasonable for Ofwat to set an expectation that industry-wide data must be used to estimate implicit allowances and that the approach effectively rules out cost adjustment claims for the majority of activities that companies need to undertake[49].

5.28 Northumbrian Water states that efficient investment of its historical allowances elsewhere across its asset base means there is no possibility that customers would be paying twice if a future uplift were provided. It states that customers have not paid for higher capital maintenance levels in the past so therefore cannot be paying twice if an uplift to allowances is provided in the future.

5.29 Northumbrian Water estimates an implicit allowance of £8.1 million for the water element of the claim, and £12.8 million for wastewater.[50]

Our assessment

It is not appropriate to calculate what base buys using internal data only, particularly when companies had the opportunity to request additional sector wide information to help inform their business plan submissions

5.30 Before applying an adjustment to modelled base allowances, we must first establish what base buys. This ensures that customers do not pay twice for investment. When establishing this, it is important to look at rates of refurbishment and replacement across the sector. This avoids biasing what base buys by focusing on one single company who may have underinvested in its assets historically.

5.31 As discussed in the final determination, one of the issues we face when assessing what base buys for a wider range of assets is data availability.[51] We moved away from our previous more granular data collection approach following the recommendations of the Gray Review

[48] [OF-CA-054] Ofwat, Northumrbian Water base cost adjustment claim feeder model, December 2024, NES_CAC1, NES_CAC2.
[49] [OF-OA-002] Northumbrian Water, Statement of Case, March 2025, pp. 80, para. 267
[50] [OF-CA-056] Northumbrian Water, Statement of Case – Appendix 2, March 2025, p.16
[51] [OF-OA-022] Ofwat, PR24 final determinations: Expenditure allowances, December 2024, p.90

to reduce data collection, and the associated regulatory burden.[52] It is therefore extremely important for companies to identify areas where they think there are data gaps that will inhibit its ability to develop robust business cases and Ofwat's ability to assess business plan submissions.

5.32 In the build up to PR24, we gave all water companies the opportunity to seek further information to support their PR24 business plan submissions through our cost assessment working groups. We held a session with the companies that focused on additional reporting requirements, with a discussion focusing on specific data requirements to support the submission of cost adjustment claims at PR24.[53]

5.33 Following this working group session, we issued an information notice and data requests to collect the data raised by the group.[54] This request allowed for the inclusion of sector wide cost data relevant to the assets identified in the company's original business plan submission, which could have then been used to arrive at a view of what base buys. However, Northumbrian Water did not use this opportunity to suggest additional data collection that would have helped to support its case.

5.34 It is therefore inappropriate for the company to use data unavailability as a reason for not establishing a more robust view of what base buys. Moreover, Northumbrian Water does not provide compelling or robust evidence to demonstrate how it has calculated its internal view of what base buys.

5.35 Without a robust and reliable assessment of what base buys, there is a high risk of customers paying twice and the company being double funded when assessing the value of any adjustments to its allowances. We note that relatively few companies submitted cost adjustment claims to request additional capital maintenance allowances related to assets other than mains and meters.

5.36 Through our enhancing asset health understanding workstream, we are working with the sector to collect additional information on a wider set of assets. This will include asset condition, workload and expenditure data that can be used to establish what base buys. Our emerging short list of assets for further consideration includes civils assets at wastewater and water treatment works, and service reservoirs. We provide further discussion on the workstream and progress made in our addressing asset health document.[55]

Issue 3 - Efficient investment of base cost allowances

Our final determination

5.37 The evidence provided by the company suggested that it had not sufficiently maintained asset condition in previous years and had not replaced or refurbished long-life assets at the

[52] [OF-CA-060] Review of Ofwat and consumer representation in the water sector, page 5.
[53] [OF-CA-061] Ofwat, Base modelling CAWG March 2022, March 2022.
[54] [OF-CA-004] Ofwat, IN 22/02 Cost assessment data requests, April 2022
[55] Ofwat, 'PR24 redeterminations – expenditure allowances – addressing asset health', April 2025

optimal time to balance expenditure requirements over the long-term[56]. We therefore had concerns that allowing this investment would lead to customers paying twice.

5.38 We concluded that, in the round, Northumbrian Water's base expenditure allowance at final determination was sufficient for it to deliver the capital maintenance that was included in its cost adjustment claims. At final determination, the company's base expenditure allowance was 11% higher than at PR19, 4.8% (£179 million) below its draft determination representations proposal, and only 1.8% (£64 million) below its original business plan. The company's base cost challenge was no greater than the sector average base cost gap.

Issues raised by Northumbrian Water

5.39 Northumbrian Water states it has previously demonstrated strong performance in asset management.[57] It states that it did not carry out the work proposed in its case in previous regulatory periods because these assets were not identified as priorities. Rather, this expenditure was invested on other assets that were identified as higher priority using asset risk management principles. [58]

5.40 The company includes internal analysis to demonstrate it has maintained the condition of its assets over the period from 2010-2022 to evidence why the proposed investments have not been made previously.[59]

5.41 The company states that historical base allowances have been insufficient, which has led to underfunding.[60] It presents internal evidence to demonstrate that it has spent more on capital maintenance than has been recovered from customers after cost sharing since AMP3. The company states that historical investment decisions have been prudent, ensuring that asset health has been sustained without unnecessary expenditure.[61]

Our assessment

The evidence provided by the company does not demonstrate good asset management practice, nor does it demonstrate efficient use of historical base allowances

5.42 We do not agree that Northumbrian Water has demonstrated strong performance in asset management. This assertion[62] is the result of a limited data request exercise undertaken in September 2024 as part of Ofwat's operational resilience working group. The exercise focused on six specific areas, providing a very narrow scope and as such, can in no way be seen to be reflective of a company's overarching capability in asset management. In addition, companies did not provide any supporting evidence to the claims made as part of this exercise. This means that any assessment undertaken was purely hypothetical and

[56] [OF-CA-054] Ofwat, Northumrbian Water base cost adjustment claim feeder model, December 2024, NES_CAC1, NES_CAC2.
[57] [OF-OA-002] Northumbrian Water, Statement of Case, March 2025, p.81, para. 273
[58] [OF-OA-002] Northumbrian Water, Statement of Case, March 2025, p.82, para 274
[59] [OF-OA-002] Northumbrian Water, Statement of Case, March 2025, p.82, para. 275
[60] [OF-OA-002] Northumbrian Water, Statement of Case, March 2025, p.84, para. 293
[61] [OF-OA-002] Northumbrian Water, Statement of Case, March 2025, p.82, para. 276
[62] [OF-OA-002] Northumbrian Water, Statement of Case, March 2025, p.58, para. 183

intended to help support companies in identifying opportunities for improvement / collaboration with the sector. In the last asset management maturity assessment (AMMA) in 2021, Northumbrian Water's overall score was 12 out of the 15 companies, with the lowest score across the water and sewerage companies[63]. This highlights that the latest evidence would indicate in all likelihood Northumbrian Water had less mature asset management practice than the rest of the sector.

5.43 Moreover, the company has not provided compelling evidence that it has good asset management practice and has maintained the condition of the assets included in its proposal. The conclusions we drew above in relation to the quality of the company's supporting evidence on the list of schemes and their recent development of a deterioration model in September 2024 illustrate this. The company has been unable to provide historical data, relying on a single set of inspections in 2022/2023 for the condition of the selected assets to demonstrate how condition has changed over time. This likely indicates that the company has not previously been collecting this data, or analysing the health of its civils assets.

5.44 The information on the condition of water treatment assets in 2022/2023 has likely been collected due to a notice from the DWI in 2021 (NES-2021-00002) to undertake hazard reviews at all of their surface and groundwater treatment works by 31 October 2023 to ensure compliance with Regulation 26 and Regulation 4 of the Water Supply (Water Quality) Regulations 2016[64]. Regulation 26 states that the "water undertaker or supplier must design, operate and maintain the disinfection process."

5.45 We therefore disagree that the company has invested its historical allowances efficiently, and reiterate that spending allowances in full does not equate to efficient investment. Northumbrian Water has a duty to understand its asset base, and invest in maintaining this. The company is proposing material investment, with an immaterial view of what base buys, across a number of its critical assets. This again indicates the low level of investment that the company has diverted towards these assets historically.

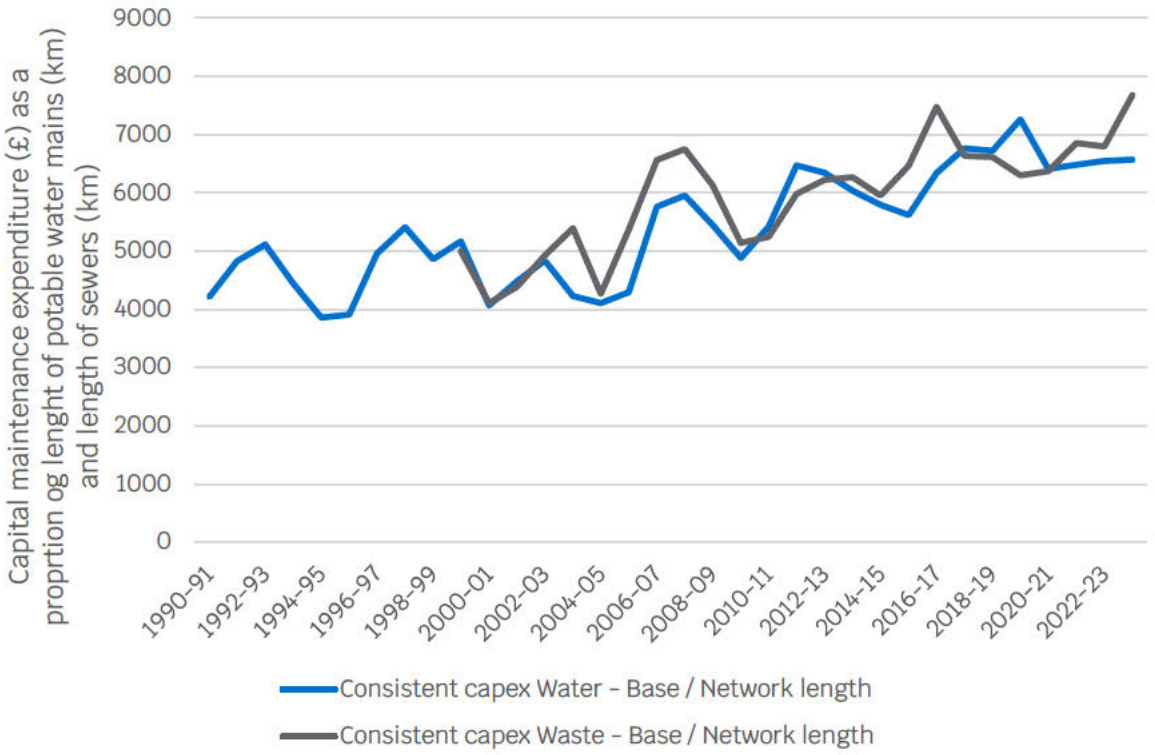
5.46 The company has not been able to demonstrate how it has spent its historical capital maintenance allowances, and has provided evidence that indicates that the company has not collected enough information on its assets historically to understand investment requirements. Given the scale of investment it now considers is required across the asset base, considering both infra and non-infra assets, we consider there is value in the company providing more robust evidence to the Competition and Markets Authority to explain why its customers will not be paying twice beyond the fact that it has spent its PR19 allowance. As part of this, it is important to remember that there are cost sharing mechanisms in place for companies to use if additional spend is required. Companies should use this mechanism when they consider additional investment is required, and should not delay or defer investment to avoid doing so.

[63] [OF-CA-159] Ofwat, Asset management maturity assessment
[64] [OF-CA-157] Drinking Water Inspectorate, Notice of regulation Northumbrian Water Hazards review, June 2021

5.47 We have looked back to PR19 and compared modelled base allowances with companies' business plan requests and outturn expenditure. This has been looked at for the period from 2020-24. We acknowledge that the majority of companies have overspent their allowance, however note that our allowances were aligned with company business plan requests. There was a base sector wide cost gap of just 0.4%. This demonstrates that these cost pressures were unforeseen by both parties. Our allowances are a function of business plan requests. Further detail about these unforeseen cost pressures is included in the asset health response[65].

5.48 We have also looked at base capital maintenance expenditure as a proportion of network length to understand how this has increased as the asset base has grown. As demonstrated in Figure 7, this has increased over the historical period representing an average increase of 2% for water and 3% for wastewater

Figure 7: Base capital maintenance expenditure relative to total network length



5.49 We still consider that Northumbrian Water is sufficiently funded to deliver its required capital maintenance investments across the 2025-30 period. At final determination, the company's base expenditure allowance was 11% higher than at PR19, 4.8% (£179 million) below its draft determination representations proposal, and only 1.8% (£64 million) below its original business plan. The company's base cost challenge was no greater than the sector average base cost gap. This demonstrates that we have recognised the need to increase base capital maintenance allowances and as a result ensured that companies' can deliver the required capital maintenance.

[65] Ofwat, 'PR24 redeterminations – expenditure allowances – addressing asset health', April 2025

Table 1: PR24 base expenditure allowances comparisons

	PR24 final determination allowance vs PR19	PR24 final determination allowance vs 2019-20 to 2023-24 outturn	PR24 final determination allowance vs business plan	PR24 final determination allowance vs DD representations
Northumbrian Water	+11.4%	+2.2%	-1.8%	-4.8%
Sector average	+18.9%	+6.6%	+0.9%	-4.8%

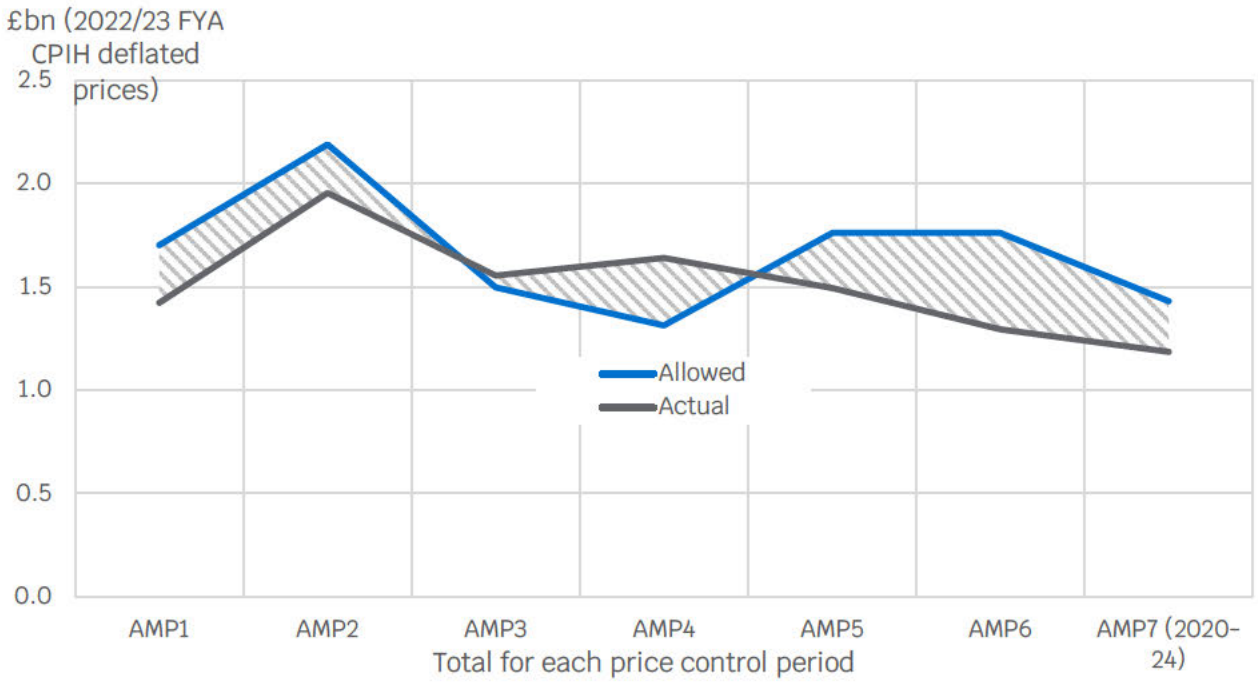
5.50 We recognise that Northumbrian Water has looked at capital maintenance allowances[66] comparing allowance with expenditure after cost sharing has been applied. We consider that it is more appropriate to look at total capital expenditure allowances including base and enhancement before cost sharing has been applied. While underspend and overspend has been subject to different cost sharing rates over time, companies have still been able to recover and keep allowances that have not been spent in period. An efficient company is then expected to use these in future periods to manage peaks in capital maintenance requirements. This explains why we look across the total capital maintenance envelope including both base and enhancement.

5.51 We have considered the sufficiency of total capital expenditure allowances across the entire historical period. We consider this is important to understand what companies have been funded to deliver.

5.52 Our analysis of this indicates that the sector has underspent its total capital expenditure allowances over time, but that there are peaks and troughs in spend. Figure 8 shows Northumbrian Water's spend over this period.

[66] [OF-CA-002] Northumbrian Water, Statement of Case, March 2025, p.57, para. 180

Figure 86: Northumbrian Water total capital expenditure



5.53 Our analysis shown in Figure 8 demonstrates that Northumbrian Water have historically underspent their total capital expenditure allowance with a cumulative underspend of £1.1 billion. We provide long term allowances and expect companies to manage peaks and troughs in capital maintenance over the long-term. While historical capital expenditure data does indicate that companies have overspent on base, it shows significant underspend on enhancement in each regulatory period.

5.54 Coupled with this, we have found no written record of companies highlighting or raising concerns with underfunding in earlier regulatory periods. We therefore consider it is possible that there is a risk of cost allocation issues over time within the capex allowance envelope, which is being inaccurately represented at PR24.

Issue 4 - Cost efficiency

Our final determination

5.55 Northumbrian Water partially passed the cost efficiency assessment gate at final determination. The company explained how it had arrived at its cost proposal, including cost benchmarking and a third-party assurance statement. But given that its proposal was not fully scoped and the resulting uncertainty in its proposed costs, we did not consider that

the company provided compelling evidence that its proposed cost adjustment was efficient[67].

Issues raised by Northumbrian Water

5.56 The company has undertaken further work to provide certainty of the scope and improved accuracy and confidence in the civils costs. The company includes third party benchmarking to demonstrate efficiency of the costs[68].

Our assessment

The company has changed the scope of its proposal, but we still have concerns with the efficiency and accuracy of its cost estimates

5.57 Northumbrian Water has provided new evidence of remedial costs for each asset. These costs range from £1,723 to £39,273,846.[69] No information is provided about the scope of these remedial works, except for the 23 schemes that range in cost from £1 million to £39 million where a one-sentence description is provided.[70]

5.58 Northumbrian Water states that it has significantly improved the level of confidence in its largest 23 schemes, which represent 60% of the programme value by developing bottom-up cost estimates for these schemes. No scheme build-up is provided for these schemes. Consequently, it is not possible for us to interrogate or benchmark the costs for the proposed asset health schemes.[71]

5.59 Northumbrian Water has provided new evidence of cost assurance. It has provided contractor quotes for four out of 23 of these larger schemes, covering trickling filters, PSTs, clarifiers and inlet channels. These schemes represent £2.6 million of the total request (1.44%). There is a scheme-level variance of -9% to +26% on these four schemes, with a -1% mean variance. The variance on individual schemes is significant. As the cost output structures of the company's and contractor estimates are different, it is not possible to understand the discrepancies in the benchmarked costs.

[67] [OF-CA-054] Ofwat, Northumbrian Water base cost adjustment claim feeder model, December 2024, NES_CAC1, NES_CAC2.
[68] [OF-CA-056] Northumbrian Water, Statement of Case – Appendix 2, March 2025, p.4, para. 3
[69] [OF-CA-057] Northumbrian Water, SOC010 – PCD civil structures, March 2025
[70] [OF-CA-062] Northumbrian Water, SOC008 – Recosting, March 2025
[71] [OF-OA-002] Northumbrian Water, Statement of Case, March 2025

Figure 97: Benchmarking results[72]

Table 3: Aqua-A&A EPS benchmarking results

	Aqua (£k)	A&A EPS (£k)	% difference
Birtley	997	979	+1.8%
Mosswood	925	996	-7.1%
Sedgeletch	354	389	-8.8%
Willington	318	252	+25.9%
Total	2,594	2,616	-0.8%

5.60 For these 23 larger schemes, the scope and costs have changed significantly since final determination. For example, the scope of works at Larrington WTW changed from the replacement of four tanks, to repair 50% of walls. These scope changes have resulted in a 59% increase in requested water allowances and a 39% reduction in wastewater allowances. This further provides evidence that the outputs and costs at final determination were not sufficiently robust.

5.61 This also demonstrates that, if this request has been allowed at final determination, there would have been significant risk of the company delivering an inappropriate solution and non-delivery of investment. Moreover, Northumbrian Water would have benefitted from a 5% windfall gain as shown in the table below.

Figure 10: Requested adjustment to allowance[73]

FIGURE 1: OVERVIEW OF THE REQUESTED ADJUSTMENT TO ALLOWANCES: CHANGES FROM BP24 TO SOC

Investment area	Stage	Water (£mn)	Wastewater (£mn)	Total (£mn)
Treatment works civils refurbishment	BP24	17.8	94.4	**112.2**
	DDR	17.8	123.6	**141.4**
	SoC	56.2	75.6	**131.7**
Service reservoir replacement	BP24	0	0	**0**
	DDR	47.8	0	**47.8**
	SoC	47.8	0	**47.8**
All asset health	BP24	17.8	94.4	**112.2**
	DDR	65.6	123.6	**189.2**
	SoC	104.0	75.6	**179.5**
% Change	DDR	+268%	31%	**+69%**
	SoC	+59%	-39%	**-5%**

5.62 For the remaining 40% of the programme, which comprises low value schemes, the company has benchmarked the costs of five schemes. The value of these schemes total

[72] [OF-CA-063] Northumbrian Water, SOC006 – Cost benchmarking report, 2025
[73] [OF-OA-002] Northumbrian Water, Statement of Case, March 2025

£3.66 million, which is 2.04% of the overall request. No information is provided on the rationale for the selection of the sample of these five schemes.

5.63 Across the entire cost adjustment claim, Northumbrian Water has provided cost benchmarking for £6.3 million of costs, representing 3.5% of the total request. The scheme-level cost variance between Northumbrian Water's and their assurer's costs range from -42.9% to +25.9% with no explanation for the reasons. This does not provide compelling evidence that Northumbrian Water's costs are efficient for customers.

5.64 We note that contractor quotes alone are not enough to demonstrate cost efficiency. It is important that external benchmarking is conducted to ensure that customers do not pay for its own water company's relative inefficiency compared to other water companies. Customers cannot choose their water company. So it is important that we challenge company costs using benchmarking to protect customer interests.

Issue 5 - Absence of clear outputs to hold the company to account

Our final determination

5.65 Northumbrian Water did not commit to delivering a specific solution(s) in its proposal which we would have expected in a well evidenced plan. It stated that solutions would be determined through detailed inspections, if the claim was accepted.

5.66 This meant that the outputs of the investment were unclear, and it would have been difficult to protect customers from under-delivery. This also meant that the cost estimates were uncertain. This would have created a risk of windfall gains, particularly if the company decided to deliver a less costly solution[74].

Issues raised by Northumbrian Water

5.67 The company stated that it put forward 270 interventions to improve the condition of civil structures at 81 water treatment works assets and 189 sewage treatment works assets.[75] It also identified four service reservoirs requiring replacement during 2025-30 as part of its rolling programme to secure these assets in a timely way. The company originally put forward a weighted model of costs based on the probability of different tasks being required[76].

5.68 The company has completed further work to define and scope the interventions required through this investment. This includes an independent optioneering review, bottom-up

[74] [OF-CA-054] Ofwat, Northumbrian Water base cost adjustment claim feeder model, December 2024, NES_CAC1, NES_CAC2.
[75] This includes storm tanks, buildings, kiosks, chambers, overflow channels, treatment tanks, and other related civil structures.
[76] [OF-OA-002] Northumbrian Water, Statement of Case, March 2025, p.79, para. 260

scoping for a small number of high value schemes, and an independent deliverability review for service reservoirs[77].

5.69 The company has also proposed PCDs consistent with the approach that Ofwat adopted for PCDs at final determination.

- The civil structures PCD proposes scheme-specific PCD non-delivery payment rates based on the forecast cost of delivering the scheme and ensures measurable improvements in condition grades.
- The service reservoir PCD ensures that the new reservoirs will provide equivalent capacity to those being abandoned, ensuring continuity of treated water storage, failing which the associated PCD non-delivery payment would apply.[78][79]

Our assessment

5.70 Northumbrian Water has provided new evidence within its statement of case to support its investment proposal, including a list of schemes and revised costs for the 20 largest schemes.[80] [81] However, the outputs of the schemes proposed by the company are not sufficiently defined to protect customers from inefficient spend and non-delivery of investment.

5.71 The company provides limited information about the output that will be delivered by each scheme. For the 20 largest schemes, ranging in cost from £1million to £39million, a single sentence description is provided of the scheme. For example, "50% of the external wall to be repaired".[82]

5.72 For the remaining 345 schemes, the company provides a limited description of the current condition of the asset and no information is provided on the solution proposed. An example of the output information provided for Walpole water treatment works (WTW) is provided below. From these descriptions of the asset condition, the remedial activity Northumbrian Water is proposing to deliver is not defined.

Figure 11: Proposed outputs for Walpole WTW[83]

Site and asset	Issue
Walpole WTW - Grade 4a Civils Defect - Treated Water Storage Tank	Concrete spalling and active leakage in form of wet exterior wall. Past repairs appear to be where leaks are occurring.
Walpole WTW - Grade 4b Civils Defect - Aeration tank	Weathered steel tanks.
Walpole WTW - Grade 4b Civils Defect - Backwash Tank	Mineral deposition at base of tank potentially indicating leakage. Further investigation needed.

[77] [OF-CA-056] Northumbrian Water, Statement of Case – Appendix 2, March 2025.
[78] [OF-CA-069] Northumbrian Water, Statement of Case – Appendix 3
[79] [OF-CA-070] Northumbrian Water, Statement of Case – Appendix 4 March 2025.
[80] [OF-CA-057] Northumbrian Water, SOC010 – PCD civil structures, March 2025.
[81] [OF-CA-062] Northumbrian Water, SOC008 - Recosting, March 2025.
[82] [OF-CA-062] Northumbrian Water, SOC008 - Recosting, March 2025.
[83] [OF-CA-057] Northumbrian Water, SOC010 – PCD civil structures, March 2025.

5.73 The company does not provide compelling evidence that the solutions it proposes are efficient, and will provide value for money for its customers. In its statement of case, the company provides new evidence of its high-level, generic approach to optioneering for enhancement cases with an industry-standard totex hierarchy.[84] The company does not provide information on the options considered across the entirety of its asset health programme or at a site level. It is also supported by a statement from its consultants that the optioneering process is "not always explained in enhancement cases".[85]

5.74 In its statement of case, Northumbrian Water proposes a PCD for water and wastewater treatment works. The PCD is based on "the number of interventions completed, which change the condition of the named asset to condition grade 1 (good) or 2 (fair), " with each deliverable having a scheme-specific rate set out in the scheme list[86].

5.75 As set out above, there is no scope of work provided for the scheme list, only a short description of the current state of the asset. It is not possible to assess whether the scheme-specific outputs provide best value for customers and the costs are efficient.

5.76 Overall, we consider that our concerns relating to the efficiency of its proposed investment remain. In its statement of case, Northumbrian Water has not provided compelling evidence that the solutions selected are providing best value for customers.

Issue 6 - Risk of delaying investment

Final determination

5.77 Northumbrian Water received a sufficient base expenditure allowance to deliver the capital maintenance investment it is requesting through its cost adjustment claim.

5.78 We set out our plan to work with the sector through our enhancing asset health understanding workstream to collect additional asset condition, asset health, workload and expenditure data on a priority list of assets. As part of this, we will assess whether there are asset condition issues that need to be, and can be, addressed ahead of the next price review period. This could result in additional allowances for companies during the PR24 period.

Issues raised by Northumbrian Water

5.79 Northumbrian Water states that delaying the proposed investment till the 2030-35 period will lead to increased repair costs. This is because as concrete structures age, the nature of faults or defects that could materialise become progressively more severe and the cost of repair increases significantly.[87]

[84] [OF-CA-071] Northumbrian Water, SOC005 – Optioneering report, March 2025
[85] [OF-CA-071] Northumbrian Water, SOC005 – Optioneering report, March 2025
[86] [OF-CA-069] Northumbrian Water, Statement of Case – Appendix 3, March 2025
[87] [OF-CA-056] Northumbrian Water, Statement of Case – Appendix 2, March 2025, p.23, para. 79

5.80 It states that well-timed interventions during the propagation phase will lead to longer-lived assets, lower costs over the longer term and reduced risk of catastrophic failure.

5.81 Northumbrian Water states that its investment case is underpinned by deterioration modelling and that Aqua consultants have assessed the approach, stating it demonstrates a strong understanding of the factors driving asset deterioration, therefore reinforcing confidence in the asset management strategy.

Our assessment

5.82 At each stage of the PR24 process, the company has changed its request. Between business plan submission and draft determinations, and now between its representations and its statement of case. In its statement of case, the company has increased the value of its water assets investments by more than 50%, and reduced its wastewater request by the equivalent. This significant change over time in the proposed investment is not aligned with a company that has a good understanding of its asset base and the investment that is required. This further raises concern that the company does not have good understanding of when the investment is required and as a result the effect on costs resulting from delaying the proposed investment.

5.83 As discussed throughout our response, we have significant concerns with the assumptions used by the company in its proposal, and the lack of transparency and confidence in its proposed scope and cost of investment. Should the company find that it must deliver additional investment in period, that goes beyond what base buys, there are cost sharing mechanisms to allow the company to recover a proportion of overspend from customers.

5.84 The assets included in the company's claim have commonly been identified as priority assets across the sector for the 2025-27 period as part of our enhancing asset health understanding workstream. We are therefore exploring further data collection on these assets with the sector as part of this workstream, with the potential for additional allowances provided if any sector wide asset condition / health issues are identified.

6. Southern Water – Advanced anaerobic digestion upgrades

Southern Water disagree with our decision to reject its cost adjustment claim for investment in advanced anaerobic digestion (AAD) at two sludge treatment centres.

We consider the company has failed to present compelling evidence to demonstrate the need for adjustment or that proposed costs are efficient for the following reasons:

- The company can deliver the investment with its bioresources base cost allowance. The inclusion of sludge quality enhancement expenditure within the base cost models and calculating the catch-up challenge based on the full modelling period ensures provision of long-term allowances for AAD investment.
- Other companies have delivered AAD upgrades with base expenditure allowances in the past. So allowing a cost adjustment on top of the allowances from the bioresources base cost models would discourage companies from investing in AAD from base expenditure allowances in the future.
- Southern Water fails to consider future opex savings and the introduction of cost sharing in its calculation of the claim.
- The updated Notified Item for bioresources protects companies from increased costs of compliance with changing legislation.

The proposed investment is not eligible under the Direct Procurement for Customers (DPC) regime as it does not meet the relevant criteria and DPC is not intended to focus on bioresources.

Our final determination

6.1 Southern Water raised a cost adjustment claim to invest in advanced anaerobic digestion (AAD) at two sludge treatment centres: Ashford and Ham Hill. In the draft determination, we reallocated this cost adjustment to enhancement for separate assessment. After Southern Water resubmitted the claim in its representation, we assessed the request as a cost adjustment claim in our final determination.[88]

6.2 In our final determination, we did not allow the claim on the basis that the company did not provide compelling evidence to justify the need for an adjustment. The changes made to the bioresources models in the final determination provided funding for companies to deliver AAD upgrades with base expenditure allowances:

[88] [OF-CA-074] Ofwat, Southern Water base cost adjustment claim feeder model, December 2024, worksheet 'SRN_CAC5'

- We included historic sludge quality enhancement expenditure within the scope of base bioresources costs. This addressed inconsistencies in the reporting of AAD investment between companies and helped to ensure that the bioresources base cost models provided a long-term efficient allowance to invest in AAD.

- We changed our calculation of the catch-up efficiency challenge to cover the full historical sample period (2011-12 to 2023-24) instead of the last 5-years of outturn (2019-20 to 2023-24) to reflect the lumpy nature of AAD upgrades.[89] This led to a less stretching catch-up efficiency challenge.

6.3 Southern Water also proposed a market based delivery framework for the AAD project in its draft determination representation, like direct procurement for customers, which would allow it to recover costs payable to the third party outside of the price review.[90] We considered Southern Water could deliver the project through existing regulatory frameworks, and could choose to competitively tender the project if it wishes.

Issues raised by Southern Water

6.4 The key disagreements that Southern Water has with our assessment of the cost adjustment claim are set out below.

- Issue 1 - bioresources base models do not capture high sludge disposal complexity.[91]
- Issue 2 – bioresources base models do not sufficiently fund AAD upgrades.[92]
- Issue 3 - inconsistency in treatment of AAD investment costs between the rejected SRN AAD cost adjustment claim and what was allowed for Thames Water via the Large Scheme Gated Process.[93]
- Issue 4 – rejection of the request to deliver this project under the DPC regime.[94]

Issue 1 – Sludge disposal complexity

Our final determination

6.5 Our final determinations bioresources base models did not include an explanatory variable to account for sludge disposal as we consider it to be endogenous. This is consistent with our PR19 approach.[95] It is also consistent with our PR24 base cost assessment principle to focus on exogenous cost drivers.[96]

[89] [OF-OA-024] Ofwat, PR24 final determinations: Expenditure allowances - Base cost modelling decision appendix, December 2024, p.46
[90] [OF-CA-247] Southern Water, SRN-DDR-016 – Bioresources AAD Cost Adjustment Claim, August 2025, p.8
[91] [OF-OA-003] Southern Water, Southern Water – Statement of Case, March 2025, pp.135-138
[92] [OF-OA-003] Southern Water, Southern Water – Statement of Case, March 2025, pp.138-140
[93] [OF-OA-003] Southern Water, Southern Water – Statement of Case, March 2025, pp.145-146
[94] [OF-OA-003] Southern Water, Southern Water – Statement of Case, March 2025, pp.313-318
[95] [OF-CA-020] Ofwat, PR19 Final determinations securing cost efficiency technical appendix, p.172
[96] [OF-OA-022] Ofwat, PR24 final determinations: Expenditure allowances, December 2024, p.15

6.6 In acknowledgement of the increasing uncertainty and company concern for bioresources activity as a result of loss of landbank, our final determination also included an amendment to the Notified Item for bioresources. [97] This was introduced as a level of protection to companies for any changes in legal requirements in relation to landbank use.

Issues raised by Southern Water

6.7 Southern Water consider that Ofwat did not acknowledge the company's unique circumstances that drive higher sludge disposal complexity. It provides additional evidence that the South East region has the lowest landbank availability for biosolids recycling of sludge to agriculture. Therefore, it states that its operating region presents logistical challenges and limits the low-cost options for sludge disposal.

6.8 The company associates its higher sludge disposal complexity with higher costs. This includes higher diesel costs as further distances are travelled to dispose of biosolids compared to companies with accessible landbanks. Additionally, Southern Water states that its higher proportion of sludge disposal to agriculture than the average company creates greater exposure to the regulations imposed by DEFRA's Chemicals Strategy and the EA's Sustainable Sludge Strategy. [98]

6.9 Southern Water commissioned a KPMG report to assess the trend in unit cost of sludge disposal since 2012-13. [99]

Our assessment

6.10 We recognise that Southern Water is subject to higher sludge disposal complexity but continue to consider that the factors driving higher costs are within its management control. Companies have always had control over their sludge disposal routes and distance travelled to disposal sites through the location of sludge treatment centres. So, including sludge disposal variables in the econometric models could incentivise the company to make inefficient investment decisions to make expenditure allowances, which would lead to customers overpaying. [100]

6.11 Our base cost models capture the location of sewage treatment works relative to sludge treatment centres. We triangulate across models that include the following population density and size of sewage treatment works explanatory variables: [101]

- Weighted average density – LAD from MSOA
- Weighted average density – MSOA
- Proportion of load treated in bands 1 to 3 (ie small STWs)

[97] [OF-OA-022] Ofwat, PR24 final determinations: Expenditure allowances, December 2024, p.163
[98] [OF-OA-003] Southern Water, Southern Water – Statement of Case, March 2025, p.137
[99] [OF-CA-242] Southern Water, SOC-2-0065_KPMG_Analysis of components of Ofwat's PR24 Final Determination cost assessment, March 2025, p.14
[100] [OF-OA-024] Ofwat, PR24 final determinations: Expenditure allowances - Base cost modelling decision appendix, December 2024, p.50
[101] [OF-OA-024] Ofwat, PR24 final determinations: Expenditure allowances - Base cost modelling decision appendix, December 2024, p.48

- Number of STWs per property

6.12 We acknowledge that sludge disposal unit costs have marginally increased over the last regulatory period. However, we note that sludge disposal costs only account for less than 20% of bioresources base expenditure.[102]

6.13 With regard to evolving legislation and the potential for increasing bioresources costs over 2025-30, we note that we included the Notified Item for bioresources as part of our final determination. In our final determination we proposed a Notified item to cover any increase in costs to bioresources reasonably attributable to any new or changed legal requirement or guidance from Defra or the Welsh Government [103] in relation to the application to agricultural land of fertiliser derived from sludge over the 2025-26 to 2029-30 period.[104] This allows price controls to be changed in-period through an interim determination if the impact on costs, met the materiality threshold.

Issue 2 – What base buys

Our final determination

6.14 Our bioresources base cost models use historical data that extends back to 2011-12 to help set efficient expenditure allowances. They do not include cost drivers that capture different methods of treatment technology, such as the proportion of sludge treated using Conventional Anaerobic Digestion and Advanced Anaerobic Digestion (AAD) technologies.

6.15 Following consideration of draft determination representations, we amended our bioresources base cost models in our final determination to include historical sludge quality enhancement costs. We also amended the catch-up efficiency challenge to be calculated over the full sample period instead of the last 5-years of outturn.

Issues raised by Southern Water

6.16 Southern Water states that its Conventional Anaerobic Digestion technologies are approaching the end of their asset life, becoming increasingly expensive to operate and that the quality of sludge they produce is worsening. The company states that without replacement of these assets, the effectiveness and efficiency of sludge treatment activity will diminish.[105]

6.17 Southern Water disagrees that AAD upgrades can be delivered using the base allowance, despite the amendments to the models to include sludge quality enhancement.[106]

[102][OF-CA-249] Ofwat, SRN-AAD-cost-adjustment-claim-analysis
[103] Under any enactment or subordinate legislation to the Environment Agency or Natural Resources Wales with respect to the exercise of its functions.
[104][OF-OA-022] Ofwat, PR24 final determinations: Expenditure allowances, December 2024, pp.161-162
[105][OF-OA-003] Southern Water, Southern Water Statement of Case, March 2025, p.138
[106][OF-OA-003] Southern Water, Southern Water Statement of Case, March 2025, p.135

6.18 The company reiterates that the modelling period excludes significant AAD investments in the sector. It refers to additional allowances awarded to Northumbrian Water and Dŵr Cymru before 2011-12.[107]

6.19 Additionally, Southern Water commissioned a report by KPMG to estimate the AAD implicit allowance within the base models.[108] Southern Water use this work to estimate an implicit allowance of £11.5 million, which it considers to be insufficient to fund the investment. The implicit allowance used by the company was chosen by comparing the modelled allowances between models that include and exclude sludge quality enhancement expenditure.

Our assessment

6.20 Our approach to setting bioresources base expenditure allowances at PR24 final determinations ensures we provide long-term efficient allowances that are sufficient for companies to fund AAD upgrades.

6.21 Our models do not include a variable to capture the types of sludge treatment methods used by wastewater companies as this is within management control. This could discourage companies from making efficient investment decisions, such as upgrading to AAD. For example, including "% sludge treated with AAD" would discourage companies like Southern Water from investing in AAD as the bioresources allowance would decrease as the percentage of sludge treated with AAD increases.

6.22 More generally, we consider it is inappropriate to include explanatory variables in our base cost models that are inside company control. This would go against our base cost assessment principle to focus on exogenous cost drivers to prevent perverse incentives.

6.23 Our bioresources models are estimated using a long-time series of historical data that extends back to 2011-12. Data back to 2011-12 was collected at PR19. The 2011-12 cut-off year was decided in collaboration with water companies. It allowed for a long-time series of data, while ensuring backcast historical data was accurate.

6.24 For final determination, we estimated the implicit allowance for AAD investment from the base cost models by estimating the bioresources base cost models with and without AAD upgrade costs.[109] KPMG applied a similar methodology.[110] But we used all AAD upgrade costs to estimate the implicit allowance, instead of sludge quality enhancement costs only. Our approach is more appropriate as it accounts for reporting inconsistencies between companies. For example, companies have previously reported AAD upgrade costs under base capital maintenance, sludge growth, and sludge quality enhancement. As a result,

[107][OF-OA-003] Southern Water, Southern Water Statement of Case, March 2025, p.141
[108][OF-CA-242] Southern Water, SOC-2-0065_KPMG_Analysis of components of Ofwat's PR24 Final Determination cost assessment, March 2025
[109][OF-CA-249] Ofwat, SRN-AAD-cost-adjustment-claim-analysis
[110][OF-CA-242] Southern Water, SOC-2-0065_KPMG_Analysis of components of Ofwat's PR24 Final Determination cost assessment, March 2025, p.5

Southern Water's approach leads to a significant underestimate of the implicit allowance. Our analysis indicated an AAD upgrade implicit allowance of £32 million.

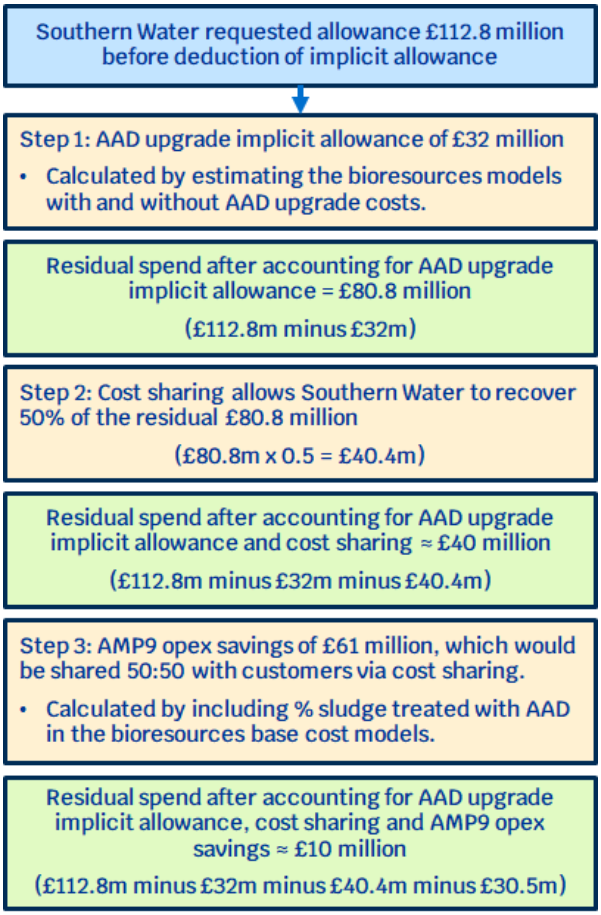
6.25 Southern Water also did not account for future opex savings from investing in AAD (eg spend to save). Upgrades of sludge treatment centres to AAD will allow Southern Water to generate more energy, which it can use to offset its own bioresources power costs or sell to raise additional revenue. To estimate future opex savings, we included proportion of sludge treatment through AAD in the bioresources base cost models and calculated how much Southern Water's hypothetical allowance would reduce by if it increased the percentage of sludge treated through AAD to 100%. This led to estimated opex savings of £61 million for 2030-35.

6.26 Southern Water also did not account for the introduction of cost sharing for bioresources at PR24, which allows it to recover around 50 percent of any overspend from customers. If Southern Water overspends in 2025-30, it will only bear half of the costs of its overspend, but will only retain half of its future savings.

6.27 Overall, we maintain our final determination position that the combination of the implicit allowance, cost sharing, and future opex savings is sufficient to allow Southern Water to deliver AAD upgrades with bioresources base expenditure allowances.

6.28 The residual cost facing Southern Water for the AAD upgrades after accounting for all three elements (AAD upgrade implicit allowance; 2030-35 opex savings; and cost sharing) is around £10 million. This is conservative as it only accounts for opex savings in one regulatory period when the asset life of the AAD assets exceeds 20 years,[111] and does not account for implicit allowances it has received to deliver AAD upgrades in previous regulatory periods but has actively chosen not to.

Figure 12: Southern Water advanced anaerobic digestion upgrade implicit allowance calculations illustration



6.29 The average share of AAD in the industry increased from 41% in 2015-16 to 51% by 2019-20, and we observed a 29% increase in bioresources base costs in the same timeframe with very low sludge quality and sludge growth expenditure.[112] This indicates that other companies have delivered AAD upgrades with base expenditure allowances in the past. For example, Severn Trent Water reported capacity added/capacity converted to AAD from 2014-15 as funded primarily through base cost allowances.[113] So allowing a cost adjustment on top of the allowances from the bioresources base cost models would discourage companies from investing in AAD with base expenditure allowances in the future. It would also lead to customers paying twice for AAD upgrades. The CMA may want to consider introducing a price control deliverable to hold Southern Water to account for delivery of the AAD upgrades in 2025-30 with bioresources base expenditure allowances.

Issue 3 – Inconsistency of treatment

Our final determination

[112] [OF-CA-249] Ofwat, SRN-AAD-cost-adjustment-claim-analysis
[113] [OF-CA-252] Severn Trent Water, OFW-OBQ-SVE-085 – query response, Table 1

6.30 In its draft determination representation, Thames Water raised a sludge treatment investment proposal: Beckton Sludge Powered Generator replacement scheme.[114] Our final determination accepted the need for investment and adjustment through the large scheme gated process.[115]

Issues raised by Southern Water

6.31 Southern Water considers that our assessment of its AAD cost claim is inconsistent with the treatment of Thames Water's Beckton scheme. The company compares the two cases and draws on the following similarities[116]:

- Bioresources treatment technology proposed is AAD
- Purpose of investment is to replace ageing treatment assets
- Considered by Ofwat to be base expenditure
- Similar 2025-30 forecast costs

Our assessment

6.32 We disagree with Southern Water that there has been inconsistency in the treatment between the two schemes.

6.33 We identified the Beckton Sludge Powered Generator replacement scheme as potentially meeting the criteria for the large schemes gated process. However, we made clear that we did not allow any development funding allowance or contingent allowance under this process (differently to all other large gated schemes), as we calculated that the implicit allowance is sufficient to cover development costs for the scheme. We made clear we would only consider providing additional allowances above the implicit allowance to avoid customers paying twice, once through the bioresources base cost models and again through the large scheme gated process.

6.34 Therefore, Thames Water receive a £99.8 million conditional cost adjustment that is dependent on delivery and assessment of gate submissions.[117] We stated that we would review the need for additional allowances with the gate submissions.

6.35 The Thames Water case and Southern Water cost adjustment claim are not comparable for the following reasons:

- Difference in risk to operational resilience
- Difference in ability to fund with base allowance

Difference in risk to operational resilience

[114] [OF-CA-253] Thames Water, TMS-DD-038-Thames-Water-PR24-DD-response-Enhancement-cases, p.81
[115] [OF-OA-022] Ofwat, PR24 final determinations: Expenditure allowances, December 2024, p.322
[116] [OF-OA-003] Southern Water, Southern Water Statement of Case, March 2025, Table 11
[117] [OF-OA-022] Ofwat, PR24 final determinations: Expenditure allowances, December 2024, p.322

6.36 Thames Water's Beckton site has a larger operational risk than the sites considered in Southern Water's claim. Our analysis shows that the Beckton site makes up 17% of Thames Water's total sludge treatment capacity whereas both Ashford and Ham Hill combined make up 12% of Southern Water's total capacity[118].

6.37 As Beckton sludge treatment centre is the largest anaerobic digestion site in the Thames region, failure of base maintenance and resilience could result in a catastrophic failure of the sludge management chain as there is the risk of a single point of failure in the short term. Thames Water detailed the impacts of failure and a capacity shortfall in its proposal. We do not consider that Southern Water has sufficiently evidenced the same resilience needs in its case for an adjustment.

6.38 Southern Water's proposed solution falls under the category of medium-to-long term strategy solution rather than imminent resilience risk requirements.

6.39 Southern Water's case aims to consolidate seven sludge treatment centres in Kent into two AAD facilities at Ashford and Ham Hill.

6.40 It is within the company's management control to identify the most efficient way to deliver its bioresources strategy. We note that site rationalisation offers significant cost benefits through economies of scale.

6.41 Site consolidation may bring additional benefits as the reduction on capital maintenance and other regulatory requirements such as Industrial Emissions Directive (IED) compliance costs at the sites set to be decommissioned or closed to operation.

Difference in ability to fund with base allowance

6.42 Overall we concluded that it was not feasible for Thames Water to deliver the necessary investment at Beckton with its base expenditure allowance.

6.43 We estimated an implicit allowance for Thames Water in relation to the Beckton sludge powered generator replacement of £67 million. Compared to the total requested AMP8 allowance of £166.8 million.

6.44 Thames Water also already treats around 54% of sludge via AAD, compared with 0% for Southern Water. The Beckton sludge treatment centre already treats sludge using AAD. We concluded that the incremental opex savings from Thames Water's proposed replacement of the sludge powered generator at Beckton was likely to be less significant than for Southern Water.

6.45 In contrast, Southern Water can deliver the Kent AAD upgrades with base expenditure allowances, as discussed in detail above.

[118] [OF-CA-254] Ofwat, Bioresources-market-information-data-2022-23.

Issue 4 – Inclusion in Direct Procurement for Customers regime

Our final determination

6.46 Southern Water proposed a market based delivery framework for the AAD project in its draft determination representation, like direct procurement for customers (DPC), which would allow it to recover costs payable to the third party outside of price controls.[119]

6.47 We considered Southern Water could deliver the project through existing regulatory frameworks, and could choose to competitively tender the project if it wishes.

Issues raised by Southern Water

6.48 Southern Water estimates that inclusion of the bioresources project in the DPC process will create £12 million better value for money for customers.[120] It has undertaken value for money analysis and market engagement research. This is new information.

6.49 It disagrees with our assessment that the bioresources project does not qualify for the DPC regime. It states that the project meets the eligibility criteria as the whole totex life is above £200 million and the infrastructure project is discrete.

6.50 The company considers rejection of its proposal to be inconsistent with Ofwat's duty to protect interests of customers by promoting competition and requests that the CMA reconsiders this decision in its redetermination.

Our assessment

6.51 The information provided by Southern Water is mostly new information. In its draft determination representation, the company did not explain why the DPC scheme meets the relevant criteria (more than £200 million whole life totex; discrete).

6.52 We consider the company should deliver the AAD upgrades with base expenditure allowances. It can choose to competitively tender the project if it wishes.

6.53 All other companies have not used the DPC delivery route to deliver AAD upgrades. Therefore it is unclear what additional benefits the company thinks DPC will bring.

6.54 We have doubts whether the project is more than £200 million whole life totex, particularly when future opex savings from the investment are taken into account. So, we do not consider the scheme is sufficiently material for a DPC. This is particularly when taking into account that the investment includes consolidation of existing sludge treatment centres, which wastewater companies should deliver as business as usual to optimise and efficiently deliver bioresources services.

[119] [OF-CA-247] Southern Water, SRN-DDR-016 – Bioresources AAD Cost Adjustment Claim, August 2025, p.8
[120] [OF-OA-003] Southern Water, Southern Water Statement of Case, March 2025, p.291

6.55 In addition, there is already a market for bioresources. Wastewater companies can explore alternative third-party providers to treat sludge as well as continue in-house delivery. DPC was not intended to focus on bioresources. This is clearly indicated in the PR24 methodology where we state "For PR24 DPC will apply by default for all discrete schemes over £200 million of whole life totex. This is consistent with the preferred option set out in our draft methodology and applies to all parts of the water and wastewater value chain, apart from bioresources."[121]

6.56 We also note that price control determinations under Condition B are not the legal route by which infrastructure projects qualify for the DPC delivery route. We have separate powers to designate, with the consent of the company concerned, an infrastructure project as a DPC Delivered Project under paragraph U1 of Condition U: Direct Procurement for Customers (DPC) for those companies, including Southern Water, that have this licence condition,

[121] [OF-CA-274] Ofwat, Creating tomorrow, together: Our final methodology for PR24. Appendix 5 – Direct procurement for customers, December 2022, p.5

7. Southern Water – Regional wage differentials

- Southern Water submitted a cost adjustment claim for the additional labour costs it considers it faces due to operating in a high wage area: £21.5 million for water, and £66.4 million for wastewater.
- We did not accept the need for adjustment at final determinations. We retain this view based on the new evidence provided.
- Our analysis shows that regional wage differentials are sufficiently explained by population density, which is a key cost driver in the base cost models.

Our final determination

7.1 Southern Water submitted a cost adjustment claim for the additional labour costs it considers it faces due to operating in a high wage area.

7.2 Southern Water requested a cost adjustment of £21.5 million for water, and £66.4 million for wastewater at final determinations.

7.3 The company used two approaches to estimate the required cost adjustment at Final Determinations. The company derived regional wages using ONS Annual Survey of Hours and Earnings (ASHE) data as a proxy for regional wage differences, using a weighted average of different SIC codes (i.e. industry codes), focusing on industries that the company deemed relevant for a typical water company.

7.4 The first approach calculated the cost claim by including regional wages as a driver in all water and wastewater base cost models ("within modelling approach"). However, the company used real wage levels for each company area instead of an index reflecting wage differentials – which we rejected due to concerns with interactions with real price effects. We capture real price effects outside of the base cost models, so including real wage levels in the models risk double counting / funding RPEs. The estimated coefficients were also larger than 1, which is counterintuitive as labour costs cannot be more than 100 percent of total costs. Therefore, we concluded that using real wages as a cost driver picks up other unintended variation in the cost data instead of just capturing regional wage differences between companies.

7.5 The second approach calculated the cost claim using a pre-modelling adjustment, normalising the cost data before estimated the base cost models. Using this approach, the company stated that the results are material.

7.6 Our analysis, using a pre-modelling regional wage adjustment to labour input costs, found that the water network plus and wastewater network plus regional wage cost adjustments

estimated for the company were both immaterial and sometimes negative. This reflected that regional wage differentials are sufficiently explained by population density, which is a key cost driver in the base cost models.

7.7 We did not accept the company's proposed cost adjustment claim on the basis that the company did not provide compelling evidence to demonstrate an adjustment to allowances was necessary and the requested cost adjustment was efficient.[122]

Issues raised by Southern Water

7.8 The key issues that Southern Water raises with our assessment of the cost adjustment claim are set out below.

- Issue 1 – Ofwat should use all three methods put forward by Southern Water to estimate the cost adjustment claim, instead of only relying on pre-modelling adjustment.[123]
- Issue 2 – Differences in pre-modelling adjustment findings – replicating Ofgem's approach (KPMG analysis). [124]
- Issue 3 – Population density cost drivers within base cost models do not sufficiently capture regional disparities in wage levels. [125]
- Issue 4 – The ONS indices are derived incorrectly (mean/median, SOC code weighting). [126]
- Issue 5 – Ofwat replicated Affinity Water's flawed methodology. [127]

Issue 1 – Ofwat should use three methods to estimate the cost adjustment

Our final determination

7.9 In the draft determination, the company used the "accounting method" to calculate the claim value. The company has applied the percentage difference between its wage and the rest of the country to uplift its labour costs, multiplying the PR24 modelled base costs with the labour share (38.6%). To calculate the claim value, the company multiplied the labour share with the regional wage premium. However, within these calculations, the company did not account for the ability of population density to proxy regional wage differentials. Companies operating in densely populated areas tend to face higher labour costs.

[122] [OF-CA-074], Southern Water, PR24 FD CA19 base cost adjustment claim feeder model Southern Water, December 2024, sheet 'SRN_CAC2'
[123] [OF-OA-003], Southern Water, Southern Water statement of case, 21 March 2025, pp. 150-155
[124] [OF-OA-003], Southern Water, Southern Water statement of case, 21 March 2025, pp. 152-153
[125] [OF-OA-003], Southern Water, Southern Water statement of case, 21 March 2025, pp. 155-157
[126] [OF-OA-003], Southern Water, Southern Water statement of case, 21 March 2025, pp. 158-161
[127] [OF-OA-003], Southern Water, Southern Water statement of case, 21 March 2025, pp. 157-158

7.10 We therefore rejected the “accounting method” on the basis that this approach does not account for the implicit allowances for labour costs (i.e. the level of regional wage that is already captured by including density in the base cost models). The company's approach double counts the regional labour effect, which would lead to customers paying twice.

7.11 In the final determination, the company used the “within modelling” approach The company calculates the adjustment by including a regional wage 'index' in all models.[128] We did not agree with this approach as we had concerns with including wage levels in the models as this may capture other factors as wages change over time (i.e. real price effects) in additional to differences in regional wages. This would lead to real price effects being captured twice in cost assessments – through the base cost models and through the labour RPE cost adjustment. Therefore, we considered that the inclusion of a regional wage index in the base cost models would be more appropriate (ie removing any sector wide changes in real wages over time). However, this resulted in insignificant and often counterintuitive negative coefficients (ie suggesting that companies operating in higher wage areas incur lower costs).

7.12 Therefore, we concluded it was not appropriate to use the “accounting method” and the “within modelling” adjustment for the calculation of the regional adjustment claim.

7.13 We considered the “pre-modelling” adjustment approach was the most appropriate estimation method following precedent applied by Ofgem.[129] However, our analysis showed that updating the pre-modelling regional wage adjustment approach did not support the need for a regional wage cost adjustment.[130] We found that the water network plus and wastewater network plus regional wage cost adjustments estimated for the company are both immaterial and sometimes negative. This suggested that regional wage differentials are already sufficiently captured by the inclusion of population density in the base cost econometric models.

Issues raised by Southern Water

7.14 Southern Water states that there are merits to using three approaches in estimating the impact of regional wage disparities on efficient base cost allowances.

7.15 The “accounting method” estimates the company's implicit labour cost allowance (by multiplying total base costs with the labour share) and then adjusts this upwards by the difference between the company's hourly labour cost and the industry average.[131] The company states this method is simple to understand and demonstrates the impact of this issue.

[128] [OF-CA-074], Ofwat, PR24 FD CA19 base cost adjustment claim feeder model Southern Water, December 2024, sheet 'SRN_CAC2'
[129] [OF-CA-240], Ofgem, RIIO-2 Final Determinations – GD Sector Annex (REVISED), 3 February 2021, pp. 91.
[130] [OF-CA-074], Ofwat, PR24 FD CA19 base cost adjustment claim feeder model Southern Water, December 2024, sheet 'SRN_CAC2'
[131] [OF-OA-003] Southern Water, Southern Water statement of case, 21 March 2025, p.150, para. 163

7.16 The company calculates the claim value using the "within modelling" adjustment comparing base cost allowances including and excluding the median wage index as a driver in water base models.[132] The company states that the wage driver is statistically significant and has a positive coefficient in water and wastewater base models. The company argues that this approach is beneficial as it does not require any assumptions to be made companies' labour share and therefore does not introduce noise through introducing assumptions where there is a degree of uncertainty.

7.17 The "pre-modelling" adjustment normalises model input data before models are run, using the same ASHE index developed for the within modelling adjustment.[133] After running the models with the adjusted data, the allowances are re-adjusted to account for the actual wage levels incurred. The company states that this method is established in regulatory precedent following Ofgem's approach in the electricity distribution and gas distribution sectors.

Our assessment

7.18 We do not consider that the company has submitted any new evidence on the three modelling approaches compared to the final determination. Therefore, we consider that our view of not allowing the cost adjustment remains appropriate.

7.19 For the "within modelling" approach, the company still uses real wage levels in its proposed cost models instead of indices.[134] The company's regression results also show that estimated coefficients on the real wage driver in all water base cost models are larger than 1, which is counterintuitive given labour cannot be more than 100 percent of total costs.[135] A coefficient above 1 means a 1% increase in regional wage results in an increase in total costs by more than 1%, which is implausible. The labour share of total costs is around 40%. The wastewater model results show that the coefficients are either statistically insignificant or also above 1. We therefore consider our final determination decision to not include a regional labour cost variable in the base cost models remains appropriate.

7.20 Our analysis of a potential "pre-modelling" regional wage adjustment also does not support the need for a regional wage cost adjustment. As Table 3 below shows, the regional wage cost adjustments estimated for the company are both immaterial and sometimes negative. This suggests that regional wage differentials are already sufficiently captured by the inclusion of population density in the base cost econometric models.

Table 2 – Regional wage cost adjustment value for Southern Water estimated using pre-modelling adjustment approach (£ million)[136]

Water	Water	Wastewater	Wastewater

[132] [OF-OA-003] Southern Water, Southern Water statement of case, 21 March 2025, p.153, para. 177-178
[133] [OF-OA-003] Southern Water, Southern Water statement of case, 21 March 2025, p.151, para. 163
[134] [OF-CA-241] Southern Water, March 2025, SOC-2-0069_Southern_Water_Error_4-Regional_Wages-Within_model_adjustment.xlsx, tab 'WW_Regional wage driver' and 'WW_Cost drivers'.
[135] [OF-CA-241] Southern Water, March 2025, SOC-2-0069_Southern_Water_Error_4-Regional_Wages-Within_model_adjustment.xlsx, tab 'Water model results'.
[136] [OF-CA-232] Ofwat, Regional wage analysis, April 2025

SOC code weighting	Manufacturing	SOC code weighting	Manufacturing
-22 (-2.6%)	-4 (-0.5%)	-7 (-0.4%)	9 (0.5%)

7.21 It is not clear from Southern Water's submission why its pre-modelling adjustment results are different as the company did not submit any supporting documents for this analysis. At final determination, we concluded the difference in results compared to the company were primarily due to differences in the models used. The company used the April 2023 consultation models, which are different from the models used at final determination. The company also seemed to have used a different definition for base costs, using a different and inconsistent aggregation compared to Ofwat's models. Compared to Southern Water's cost adjustment of £21.5 million for water, and £66.4 million for wastewater, our analysis suggests that (averaging across the Standard Occupational Classification (SOC) code weighting and manufacturing index approach) the adjustment for wholesale water allowances is negative, and £1 million (0.1%) for wastewater cost allowances (ie immaterial).

Issue 2 – The use of the three-region approach

Our final determination

7.22 The ONS ASHE data is split into regions – 10 regions that encompass England and Wales, one region for Scotland and one for Northern Ireland.

7.23 To assess the need for a regional wage cost adjustment, we used a 10-region approach. This means we used information on regional wage differentials across all 10-regions. We also used this approach at PR19.

Issues raised by Southern Water

7.24 Southern Water commissioned a KPMG report to calculate the regional wage cost adjustment value.[137] As part of this, it used a three region approach to assess regional wage differentials - London, South-East and elsewhere. Ofgem applied a similar approach in RIIO-GD/ED2, and assumed that labour was sufficiently mobile to eliminate material differences in regional wages outside of London and the South-East.[138]

7.25 KPMG conducted a pre-modelling adjustment, 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. KPMG argues that median wages are less affected by high earners within the wage distribution and are more reflective of typical wage levels.

[137] [OF-CA-242] KPMG, SOC-2-0065_KPMG_Analysis of components of Ofwat's PR24 Final Determination cost assessment, March 2025, p.17
[138] [OF-CA-243] Ofgem, RIIO-ED2 Draft Determinations – Core Methodology Document, 29 June 2022, para. 7.39

7.26 KPMG estimate a £19.7m adjustment in water and a £1.2m adjustment for wastewater allowances, totalling a £20.9m upwards adjustment.[139]

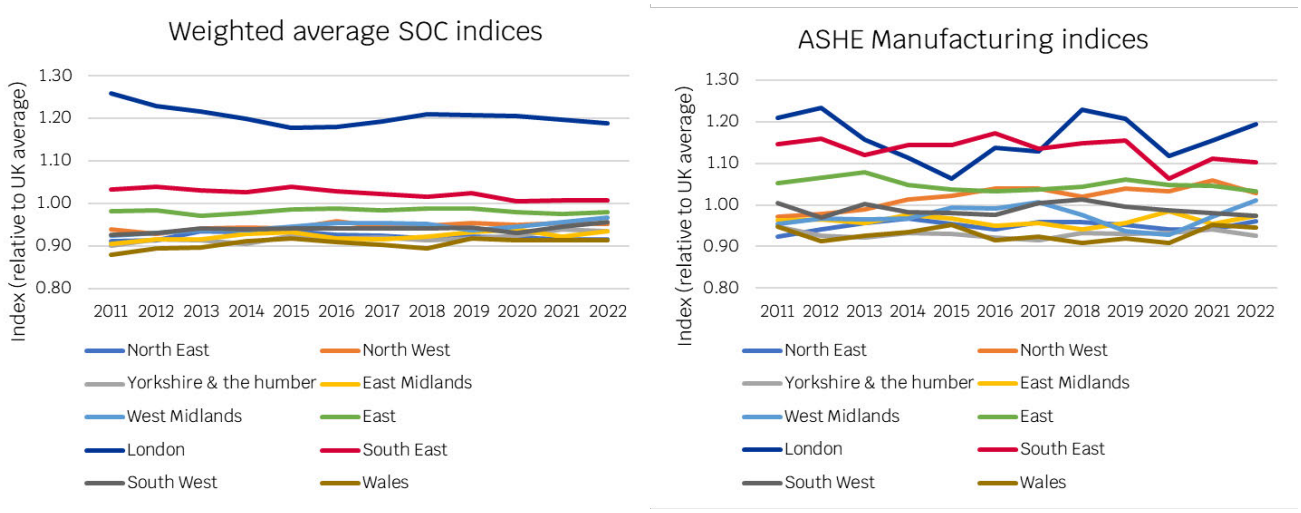
Our assessment

7.27 It is unclear why KPMG and Southern Water have used a three region approach to exploring the regional wage adjustment.

7.28 Overall, we consider the choice regarding the number of regions in England and Wales for the regional labour adjustment is not likely to materially affect the adjustment factor for Southern Water, since both the three-region approach and the 10-region approach splits south-east out as a separate region. Therefore, this decision will primarily impact the adjustment for companies that do not operate in London or south-east.

7.29 There are also some disadvantages of using the three-region approach. For instance, it may be somewhat arbitrary in determining which areas are grouped together and which should belong to 'elsewhere'. Indeed, while South East is the second highest wage region, regardless of which SOC code weighting is used, it is not clear that this region is a clear outlier compared to the third highest region (ie East). Therefore, not including East as a separate region is somewhat arbitrary.

Figure 13: 10 region indices (relative to UK average)[140]



Issue 3 – Population density cost drivers within base cost models do not sufficiently capture regional disparities in wage levels.

Our final determination

7.30 We used a pre-modelling regional wage adjustment approach to determine whether there is a need for adjustment. We found that the water network plus and wastewater network plus

[139] [OF-CA-242] KPMG, SOC-2-0065_KPMG_Analysis of components of Ofwat's PR24 Final Determination cost assessment, March 2025, p.21
[140] [OF-CA-232] Ofwat, Regional wages analysis, April 2025.

regional wage cost adjustments estimated for the company were both immaterial and sometimes negative.[141]

7.31 Therefore, we concluded that this approach suggested that regional wage differentials are already sufficiently captured by the inclusion of other cost drivers in the base cost models, primarily population density.

7.32 This is likely to be because the correlation between density and regional wages is high at between 0.58 and 0.77 for the water sector, and between 0.63 and 0.90 for the wastewater sector. Our analysis also showed that the correlation between density and regional wages remained broadly the same between PR19 and PR24.

Issues raised by Southern Water

7.33 Southern Water argues that the correlation between wage levels and population density is a spurious correlation largely driven by London.[142] The company states that when excluding Thames Water (and therefore the London region), the correlation between the ASHE wage driver and the density drivers falls significantly to between 0.11 to 0.27. The company states that 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.

7.34 Southern Water also states that a positive correlation between density and regional wage does not mean there is a causal link under which regions with higher population density consistently have higher wage levels. [143] The company states it is an example of this correlation not holding in reality, as it has disproportionately high labour costs when normalised by population density compared to its peers. It claims that it faces high wage levels in the South East, whilst its population density is aligned with the sector average.

Our assessment

7.35 While we acknowledge that the correlation decreases when excluding Thames Water from the sample, we do not agree with the company that this is an argument for giving the company extra regional wage allowances. Thames Water is also included in the base cost models dataset that estimate companies' allowances and therefore influences the regression line and the estimated coefficient on density, ie it affects how much each company benefits from the inclusion of the density variables in the models.

7.36 In our assessment of the regional wage costs claim, we tested the pre-modelling adjustment approach as well as including regional wages as an index in the models. Both

[141] [OF-CA-074] Ofwat, PR24 FD CA19 base cost adjustment claim feeder model Southern Water, December 2024, sheet 'SRN_CAC2'
[142] [OF-OA-003], Southern Water, Southern Water Statement of Case, March 2025, p.156, para. 188.

[143] [OF-OA-003] Southern Water, Southern Water Statement of Case, March 2025, p.156, para. 188.

these methodologies suggest an insignificant adjustment for Southern Water, suggesting that regional wage variation is sufficiently captured by the other drivers in the model.

Issue 4 – The ONS indices are derived incorrectly (mean vs median and SOC code weighting)

Our final determination

7.37 We applied a pre-modelling regional wage adjustment to labour input costs. Similar to the draft determination, we calculated two different regional hourly mean wage measures that aim to be reflective of occupations used by a water company: (i) ONS ASHE manufacturing wages (in line with PR24 labour real price effect for base costs); and (ii) a 2-digit SOC code weighted ONS ASHE regional wage measure that aims to reflect the occupations in a typical water company. We then calculated the value of the adjustment by taking the difference between normal base cost allowances and base cost allowances using a pre-modelling adjustment approach.

7.38 Our analysis showed that the pre-modelling regional wage adjustment approach does not support the need for a regional wage cost adjustment irrespective of the wage measure used. We found that the water network plus and wastewater network plus regional wage cost adjustments estimated for the company are both immaterial and sometimes negative.

Issues raised by Southern Water

7.39 Southern Water states that Ofwat erroneously used mean wages within its analysis, as opposed to median wages.[144] The company states that median wages are free of distortion of higher earners, and therefore is a better estimate for the wage adjustment to base allowances. It also notes that given its proximity to London, mean wage levels in the south-east are skewed upwards.

7.40 The company also states that the wage index used in the analysis fails to use relevant industry codes. [145] It states that it is incorrect to rely on SOC codes, which reflects occupational job categories. Instead, it suggests that it is better to control for industry codes (SIC codes). It also states that we included occupational job categories that are not reflective of a typical water company, such as insurance and finance, which typically have higher wage levels than in the water sector.

Our assessment

7.41 We consider it is more appropriate to use mean wages. While median wages can be less influenced by skewness in the distribution in wage, we consider that mean wages better reflect the average wages that a company incurs across all distribution of wages. Within each job category, water companies also hire staff with different levels of experience and

[144] [OF-OA-003] Southern Water, Southern Water statement of case, 21 March 2025, p.158, para. 197-201.
[145] [OF-OA-003] Southern Water, Southern Water statement of case, 21 March 2025, p.159, para. 202-209.

seniority, which typically includes higher wage staff members as well. Ofgem has also used mean wages in its recent price controls, RIIO-ED2 and EIIO-GD2.[146]

7.42 We do not solely rely on 2-digit SOC codes. Instead, we used two different regional wage measures. Our first measure uses a 100% SIC code weighting on the ONS ASHE manufacturing wages (in line with the wage index used for PR24 labour real price effects for base costs), and our second measure uses a SOC code weighting that aims to reflect the occupations in a typical water company. We do not agree that the company's approach to its SIC code weighting is an improvement to this approach. For instance, the water company includes weighting on 'water supply, sewerage, waste management and remediation activities'. We considered that this industry category is endogenous, ie influenced by the water companies itself.

Issue 5 – Ofwat replicated Affinity Water's flawed methodology.

Issues raised by Southern Water

7.43 Southern Water states that Ofwat replicated Affinity Water's flawed methodology in the assessment of the cost claim. [147] The company states that Ofwat has been influenced by company that is facing very different circumstances and affected by high population density.

Our assessment

7.44 While we replicate Affinity Water's general approach, in the sense that we applied a pre-modelling adjustment to all labour costs, we also explained that we disagree with various choices Affinity Water has made when undertaking its analysis.

7.45 In replicating the analysis, we made various independent methodological choices to ensure the adjustment claim is calculated according to Ofwat's view of the most appropriate method. For instance, we noted Affinity Water used weekly ONS ASHE wage measures, which we deemed inappropriate. Instead, we used hourly wages.[148] Using hourly wages is not influenced by the number of hours worked per week, which can differ per region. We also constructed the ONS ASHE regional labour indices following our own independent approach, using i) the manufacturing index and ii) a weighted average SOC code index.

[146] [OF-CA-240] Ofgem, RIIO-2 Final Determinations – GD Sector Annex (REVISED), 3 February 2021, p.91
[147] [OF-OA-003] Southern Water, Southern Water Statement of Case, March 2025, p.157, para. 192-196.
[148] [OF-CA-074] Ofwat, PR24 FD CA19 base cost adjustment claim feeder model Southern Water, December 2024, sheet 'SRN_CAC2'

8. Southern Water – Coastal population

- Southern Water disagrees with our decision to not allow its cost adjustment claim for £65.5 million related to the additional costs it considers wastewater companies operating in coastal areas incur.
- We did not accept the need for adjustment at final determinations. We retain this view based on the new evidence provided.
- Southern Water's econometric approach to estimating its coastal cost adjustment claim is not robust. The results are sensitive to the exclusion of Southern Water and the impact on allowances for some companies is counterintuitive.
- Unit cost analysis is inconclusive on whether companies incur more costs to operate and maintain coastal sewage treatment works than inland sewage treatment works, even after accounting for economies of scale at sewage treatment works.

Our final determination

8.1 Southern Water submitted a cost adjustment claim related to the additional costs that it considers wastewater companies operating in coastal areas incur due to a combination of factors such as stricter Ultraviolet (UV) and Total Nitrogen consents for coastal discharge; space constraints and planning restrictions; enhanced corrosion due to salinity; high load variability due to summer tourism, and stricter spill frequency constraints on coastal discharge.

8.2 Southern Water considers these factors are not captured in the sewage treatment base cost models.[149] Southern Water suggested calculating a cost adjustment by including an additional explanatory variable in the sewage treatment base cost models that captures the percentage of the population served that live in coastal areas. On this basis, Southern Water requested a cost adjustment of £65.5 million to cover the higher costs associated with operating in coastal areas.

8.3 It is important to set a high bar for cost adjustments relating to company specific factors because of information asymmetry. Companies are more likely to raise factors that lead to higher costs than other companies, than raise factors than mean a company faces lower costs than other companies.

8.4 We concluded there was not compelling evidence to demonstrate the need for a cost adjustment at final determinations. From an engineering perspective, there may be reasons why operating in coastal areas drive higher company costs. But estimating the scale of the

[149] [OF-OA-003] Southern Water, Southern Water Statement of Case, March 2025, p.163, para. 221

impact was challenging given concerns with the robustness of the coastal population variable in the econometric models.

8.5 We also conducted analysis, similar to that presented by the company, comparing the unit costs of coastal and inland sewage treatment works across all companies. The outcome was inconclusive on whether companies incur higher unit costs for coastal sewage treatment works than for inland works.

8.6 In addition, our assessment of the need for adjustment included a consideration of whether base expenditure allowances would, in the round, be insufficient to accommodate the factor without an adjustment, as set out in our cost adjustment claim criteria.[150] The company's wastewater network plus base allowance was higher than requested costs before the application of frontier shift efficiency and real price effects.

Issues raised by Southern Water

8.7 Southern Water states there were a number of methodological errors in Ofwat's large sewage treatment works unit costs analysis which led to Ofwat rejecting their claim. We summarise these issues in turn below.

8.8 Ofwat's analysis was based on a single year of data only whereas Southern Water's analysis was based on four years of data. The company considers there is more risk of Ofwat's analysis being impacted by in-year site-specific issues, which do not reflect wider long-term costs.[151]

8.9 Southern Water states that Ofwat's definition of a coastal site was 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. In contrast, Southern Water classify coastal sites as those which discharge directly to the sea or a marine harbour.[152]

8.10 Southern Water replicated Ofwat's analysis using the 2023-24 APR data at the company level for the entire sector. Southern Water suggest the results show that, on average, the unit cost of a coastal site is higher than the unit cost of an inland site.[153]

8.11 Southern Water also states that Ofwat did not account for the impact that economies of scale have on the unit cost. Southern Water states that when coastal sites are compared to inland sites of the same size, they are nearly always more expensive.[154]

8.12 Southern Water disagrees with the rejection of the claim on the basis that Southern Water's allowances pre frontier shift and real price effects are higher than requested costs for

[150] [OF-CA-001] Ofwat, Creating tomorrow, together: Our final methodology for PR24, Appendix 9 Setting expenditure Allowance, p.157
[151] [OF-OA-003] Southern Water, 'Southern Water Statement of Case', March 2025, p.171, para. 254
[152][OF-OA-003] Southern Water, 'Southern Water Statement of Case', March 2025, p.171, para. 255
[153] [OF-OA-003] Southern Water, 'Southern Water Statement of Case', March 2025, p.172, para. 257
[154] [OF-OA-003] Southern Water, Southern Water Statement of Case, March 2025, p.174, para. 262-263

wastewater, thus eliminating the need case for an adjustment. In Southern Water's view, this is inconsistent with the approach that Ofwat has applied elsewhere in determining allowances. The company points out that eight companies out of seventeen have received higher than requested base expenditure allowances and these companies received higher cost allowances through Ofwat's application of the sector-wide cost adjustments.[155]

Our assessment

We do not consider that Southern Water's econometric approach to estimating its coastal cost adjustment claim is robust

8.13 Southern Water proposes to determine a post-modelling cost adjustment based on the impact of including a coastal population variable in the base cost models. We do not consider this is appropriate. The estimated relationship between Southern Water's coastal variable and sewage treatment base costs is sensitive to the exclusion of Southern Water in the dataset. This suggested that the variable could be picking up a company specific impact which may be unrelated to operating in coastal areas.

8.14 Determining the post-modelling adjustment by including the coastal population variable in the sewage treatment base cost models, as requested by Southern Water, also leads to counterintuitive outcomes. For example, Southern Water would receive a large upwards cost adjustment, but South West Water with the second highest percentage of coastal population receives a small upwards cost adjustment. Thames Water, which has no coastal population, would also receive a higher sewage treatment base expenditure allowance. The adjustments derived based on the inclusion of the coastal population in the sewage treatment base cost models are shown in table below.[156]

[155][OF-OA-003] Southern Water, Southern Water Statement of Case, March 2025, p.176, para. 268

[156]The adjustments are calculated as the difference between the Final Determinations base cost allowances (before post-modelling adjustments and pre-frontier shift efficiency and RPEs) and the calculated allowances after including the coastal population variable in the sewage treatment base cost models.

Table 4 – Estimated cost adjustment to wastewater allowances based on inclusion of coastal population driver (£ million)

Company	% coastal population	Adjustment (£million)
ANH	9.8%	-9.3
HDD	0.1%	-0.3
NES	24.4%	7.7
NWT	11.4%	-1.3
SRN	**41.2%**	**60.1**
SVE	0%	-28.8
SWB	38.8%	4.6
TMS	0%	17.1
WSH	27.9%	-13.4
WSX	22.5%	-2.9
YKY	8.3%	-72.1

Unit cost analysis is inconclusive on whether companies incur more costs to operate and maintain coastal sewage treatment works than inland sewage treatment works

8.15 In its draft determination representation, Southern Water submitted unit cost analysis as evidence of the higher costs incurred at the company's coastal sewage treatment works relative to inland sewage treatment works.

8.16 To verify the company submission, we compared unit costs of coastal and inland sewage treatment works for all wastewater companies. This allowed us to assess if Southern Water's findings apply to other companies with coastal sewage treatment works, and are not driven, for example, by inefficiencies at Southern Water's coastal sewage treatment works.

8.17 Our analysis incorporated all large sewage treatment works (387 works), across all companies, using cost data for 2023-24. We found that, for some companies, unit costs at coastal sewage treatment works are higher than for inland sewage treatment works. For example, South West Water, which has a significant proportion of coastal works, but has a small number of works overall; and United Utilities which has a small number of coastal works. However, coastal unit costs were lower than the inland unit cost for other companies, including Southern Water, Wessex Water and Northumbrian Water.

8.18 We recognise the potential limitations of relying on a single year of data and we have updated our analysis to include more years. We present the results based on the updated dataset later in this section.

8.19 Southern Water's replication of our analysis calculates an industry wide weighted average premium of 41% at coastal sites versus inland sites.[157] We do not consider that comparing industry wide average unit costs is appropriate. To illustrate why this is the case, we note that Thames Water has the lowest unit cost for inland sites across the entire industry but the company has no coastal sites. Thames Water's low unit costs reflect the large size of sewage treatment works operated by the company. This company specific effect is captured in the industry average for inland sites but not for coastal sites. The impact is particularly significant when calculating an industry load weighted average unit cost. Given Thames Water's size, its low unit cost brings down significantly the industry weighted average unit cost for inland sites. This explains why the premium for coastal sites is 41% when comparing industry weighted average unit costs but only 17% when comparing simple unweighted average unit costs.

8.20 Regarding the definition of coastal sites, coastal plants in our analysis were defined based on their proximity to the shoreline, to create a practical and consistent classification that could be applied across all companies and sewage treatment works. While this approach may result in some plants being misclassified, we consider it achieves a good representation of coastal and inland sites. Our approach achieved 90% overall accuracy across Southern Water's sites.

8.21 Since final determinations, we have updated our unit cost analysis to include all large sewage treatment works expenditure data collected by Ofwat since 2016-17. The updated analysis avoids drawing conclusions based on a single year of data and addresses Southern Water's criticism.

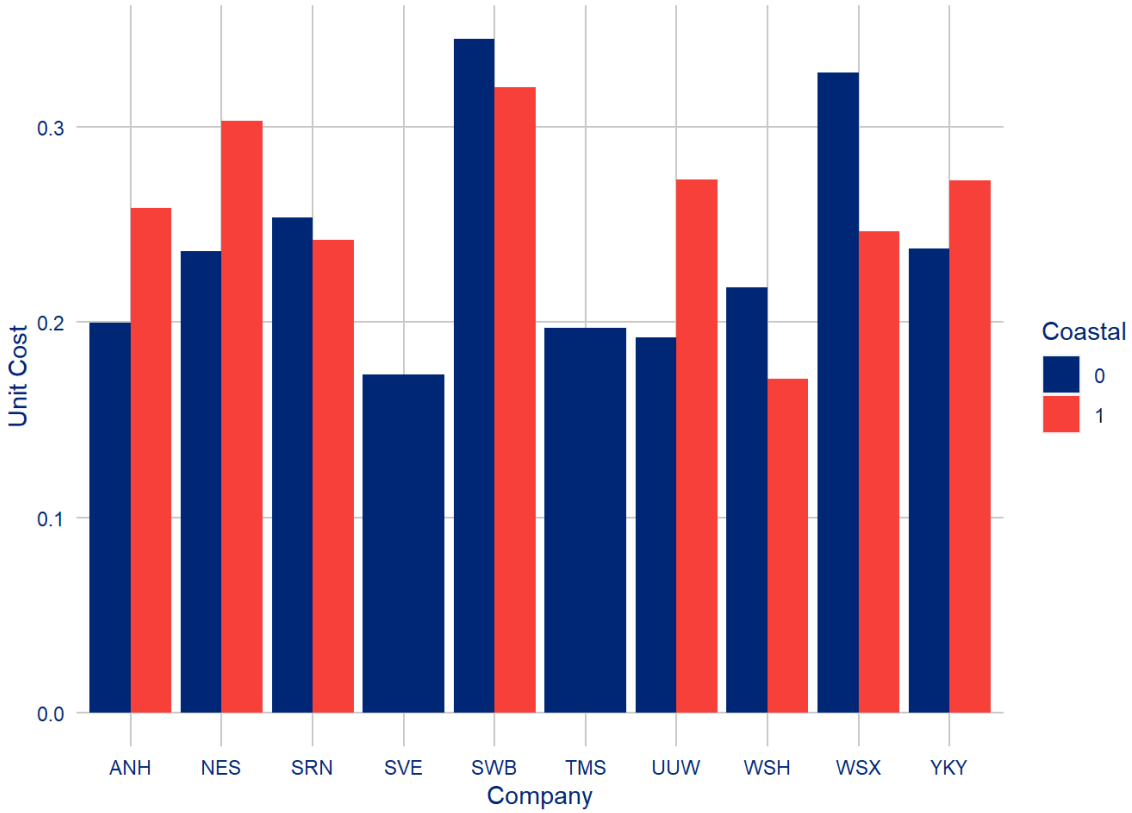
8.22 At a company level, we again find a mixed picture with coastal weighted average unit costs higher than inland ones for some companies but not for others.

8.23 Southern Water operates the highest number of coastal sewage treatment works, followed by United Utilities, Anglian Water, Dŵr Cymru, and South West Water . In contrast, Thames Water and Severn Trent Water do not operate any coastal sewage treatment works.

8.24 We find average unit costs (weighted by load) for inland sites are higher than for coastal sites for Southern Water, South West Water, Dŵr Cymru and Wessex Water. These companies treat the majority of load through coastal plants and are in fact, the companies with the largest proportion of load treated at coastal plants in the industry.

[157] [OF-OA-003] Southern Water, Southern Water Statement of Case, March 2025, p.172, Table 19

Figure 14: Unit cost by company for coastal and inland large sewage treatment works



Unit cost differences between coastal and inland sewage treatment works are not significantly different from one another after accounting for economies of scale

8.25 We replicated Southern Water's scatterplot of log unit cost against log load using separate trend lines and confidence intervals for coastal and inland sewage treatment works.[158] This helps to assess if coastal sewage treatment works exhibit higher unit costs than inland sewage treatment works.

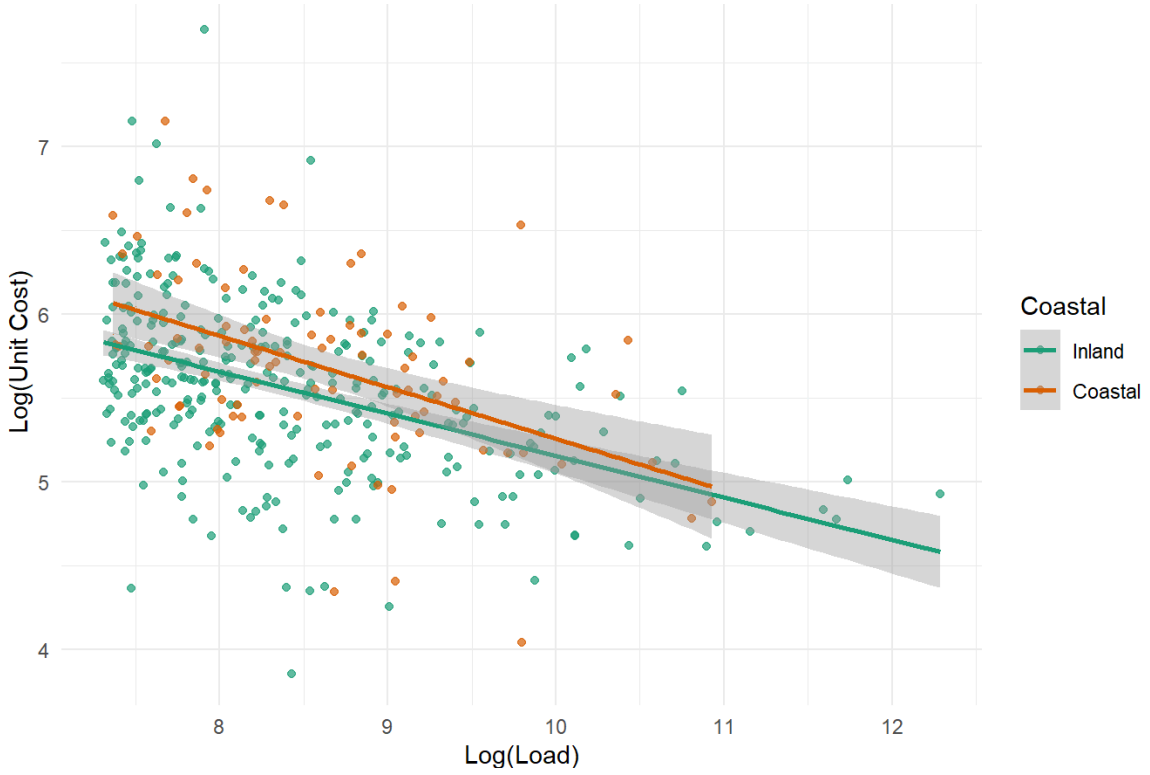
8.26 The analysis covers the most recent four years of data. The plot reveals a clear negative relationship between load and unit cost for both coastal and inland works, consistent with the presence of economies of scale in sewage treatment.

8.27 The trend lines for coastal and inland sewage treatment works are nearly parallel, suggesting a similar rate of unit cost decline as load increases. The coastal line sits slightly above the inland line across much of the distribution, but the difference is modest and largely falls within the confidence intervals, indicating that it is not significantly different from one another.

8.28 Overall, these findings suggest that coastal location may not be a meaningful driver of unit cost differences at sewage treatment works once economies of scale are accounted for.

[158] [OF-OA-003] Southern Water, Southern Water Statement of Case, March 2025, p.173, Figure 19

Figure 158: Unit costs versus load for coastal and inland sewage treatment works



We do not consider Southern Water has presented compelling evidence to demonstrate the need for a cost adjustment. But if a coastal cost adjustment is applied, it should be symmetrical

8.29 We acknowledge that Southern Water has the largest percentage of its population living in coastal areas of all water and wastewater companies at 41.2%, compared to the industry average of 19%.[159]

8.30 We also recognise that there are factors related to operating in coastal areas that could drive higher costs for companies. The magnitude of these impacts or the extent to which they are already captured by cost drivers used in the base cost models is more uncertain. There may also be factors that could drive higher costs for inland plants.

8.31 However, we do not consider the evidence submitted by Southern Water provides a compelling case to demonstrate the need for a cost adjustment. Further, the cost impact of operating near the coast seems immaterial when other factors such as economies of scale are accounted for. And Southern Water is not unique in operating sewage treatment works near the coast. For example, Southern Water's proportion of coastal population (41%) is comparable to South West Water's (38.8%). South West Water did not submit a similar cost claim.

8.32 In addition, it is important to consider whether base expenditure allowances would, in the round, be insufficient to accommodate the factor without an adjustment, as set out in our

[159] [OF-OA-003] Southern Water, Southern Water Statement of Case, March 2025, p.162, para.220

cost adjustment claim criteria.[160] The company's wastewater network plus base allowance was higher than requested costs before the application of frontier shift efficiency and real price effects. This criterion is particularly important for cost adjustment claims related to unique operating circumstances. Companies are incentivised to identify special factors that lead to higher costs for them relative to other companies, but not to identify special factors that lead to lower costs. In contrast, forward looking cost pressures affect the entire sector in a similar way. So, it would be less appropriate to reject the need for adjustment for specific companies just because their base allowances is more than requested as it could cause perverse incentives (eg disincentive to submit stretching business plans in the future). Particularly, if we expect companies to deliver a step-change in outputs beyond 'what base buys'.

8.33 Southern Water initially submitted this cost claim in its business plan as a symmetrical cost adjustment that applies to all companies. This means that some companies receive a higher allowance, and other companies receive a lower allowance as a result of the adjustment. In its draft determination representation, Southern Water revised its request and asked for a non-symmetrical adjustment applied to Southern Water only, on the basis that the company faces unique circumstances related to its coastal operations.[161]

8.34 Assuming the nature of the impacts affecting operations in coastal areas, as described by Southern Water, is correct, we expect that these factors would affect all companies with coastal operations albeit to different extents. The higher expenditure incurred by companies operating in coastal areas would also be reflected in the base cost models therefore providing an implicit allowance for coastal operations to companies that only operate inland sewage treatment works. Therefore, we would suggest that, should the CMA determine that a cost adjustment is needed, the adjustment should be applied symmetrically across all the companies so that customers do not overpay.

[160] [OF-CA-001] Ofwat, Creating tomorrow, together: Our final methodology for PR24, Appendix 9 Setting expenditure Allowance, p.157
[161] [OF-CA-248] Southern Water, 'SRB-DDR-015: Coastal Population Cost Adjustment Claim', August 2024, p. 5

9. Southern Water – Gated capital maintenance allowance

We do not consider that Southern Water's request for a gated allowance for capital maintenance should be allowed for the following key reasons:

- The enhancing asset health understanding workstream provides a clear and certain route for additional base expenditure allowances where sector wide asset health issues are identified. For example, a need to move towards a more sustainable renewal rate.
- We are concerned about the maturity of Southern Water's asset management approach and their Pioneer asset deterioration modelling.
- We can draw a clear distinction between the treatment of Thames Water through the asset health deficit conditional allowance and why this approach is not appropriate for Southern Water.
- We do not agree that companies have had insufficient base cost allowances historically to allow them to maintain good asset health.

Our final determination

9.1 At final determination Southern Water proposed a cost adjustment claim for an additional £74 million of capital maintenance expenditure to reach a sustainable base maintenance level. The claim was for investment across water service reservoirs (£14 million), rising mains (£30 million) and waste pumping stations (£30 million)[162]. We rejected this cost adjustment claim in our final determination for the following reasons:

- Asset condition information provided by the company in its PR24 business plan data tables and through the PR24 query process did not suggest that the assets included in the claim were in materially poor condition.
- There was an absence of clear outputs that will be delivered with the cost adjustment.
- There was a lack of clear link between exogenous factors and maintenance expenditure requirements.
- There was a risk of customers paying twice and discouraging the sector from delivering renewals with base expenditure allowances.
- The company did not provide sufficient and convincing evidence to demonstrate the requested costs are efficient.

Issues raised by Southern Water

9.2 Southern Water are no longer proposing a cost adjustment claim for capital maintenance but are instead requesting a gated allowance of up to £500 million. The company is proposing this allowance can be accessed in period during AMP8 when specific asset health

[162] [OF-CA-074] Ofwat, Southern Water base cost adjustment claim feeder model, SRN_CAC8.

issues are identified.[163] The company states that this would protect customers and the environmental long-term interests with funding only being provided once there is robust evidence of an asset health issue.[164] The key reasoning and arguments are set out below.

- Issue 1 – Certainty of the asset health workstream;
- Issue 2 – Consistency with the decision to provide Thames Water with an asset health deficit conditional allowance;
- Issue 3 – Sufficiency of base allowances; and
- Issue 4 - Forward looking deterioration modelling.

Issue 1 – No certainty through asset health workstream

Our final determination

9.3 We set out a roadmap for enhancing asset health understanding in the water sector as part of our final determination.[165] This included our short-term approach for the next two years, as well as our longer term plan looking ahead to PR29.

Issues raised by Southern Water

9.4 Southern Water state that although the process is set out to understand more about sector wide asset condition issues, there has been no certainty that additional funding will be made available and when this could be made available.[166]

9.5 The company also states there is lack of clarity for the approach that would be taken in the case that evidence was presented of asset health issues for one company but there was no compelling evidence of sector-wide issues.[167]

Our assessment

9.6 Over the next two-year period, we intend to work collaboratively with water companies and interested stakeholders to identify priority assets and to deliver a robust asset condition and workload dataset for these priority assets. We will use this data to inform a series of workshops with companies and stakeholders to discuss findings, solutions, and how this data can be used to assess costs at PR29 (for example through additional sector-wide capital maintenance cost adjustments). We will also assess if the findings identify any sector-wide asset condition issues that need to, and can be, addressed ahead of the next price review period (PR29). We will work with the sector to find the most appropriate solution to address any issues identified. For example, by providing additional base expenditure allowances either in-period or through the PR24 end-of-period reconciliation,

[163] [OF-OA-003] Southern Water, Statement of Case, March 2025, p.212, para. 390
[164] [OF-OA-003] Southern Water, Statement of Case, March 2025, p.212, para. 391
[165] [OF-OA-028] Ofwat, PR24 final determinations: Roadmap for enhancing asset health understanding in the water sector, December 2024
[166] [OF-OA-003] Southern Water, Statement of Case, March 2025, p.211, para. 388
[167] [OF-OA-003] Southern Water, Statement of Case, March 2025, p.211, para. 388

or by allowing companies to bring forward 2030-35 capital maintenance spending into the last two to three years of the 2025-30 period.[168]

9.7 We are making good progress with this workstream and are delivering a plan that aims to decide if additional base expenditure allowances are needed to address any sector wide asset health issues ahead of the 2027-28 financial year. We are publishing workshop material on our website.[169] We have set out the plan for this workstream and the progress we have made so far in the main asset health document.[170]

9.8 We maintain the view that additional base expenditure allowances should not be allowed to individual companies that have allowed asset condition to deteriorate unless they can demonstrate that this has been caused by factors outside of its control. Providing additional base allowances to address asset condition issues caused by a company not maintaining assets appropriately could be viewed as a failure to hold companies to account and customers paying twice for asset renewals (ie once through base cost models and again through the cost adjustment). It would also reduce incentives to maintain good asset health with base allowances in the future.

Issue 2 - Inconsistency in approach between Southern Water and Thames Water receiving a gated allowance

Our final determination

9.9 We provided allowances of up to £1 billion to fund Thames Water's asset improvement gated allowance, which will improve performance of its water and wastewater assets beyond historical levels. The allowance is to fund asset renewals and refurbishment above the base funded level of renewals and refurbishment. Allowances will be accessed through a rigorous gating process for each individual workstream. We made this allowance recognising that Thames Water needs to improve performance with respect to some of its water and wastewater assets.[171]

9.10 We stated that we expect Thames Water itself to make a suitable contribution to the cost of the improvement works when there are overlaps with expectations from base expenditure. This will be confirmed through the gated process.

9.11 Given the relatively large amount of work that the asset improvement gated allowance will involve for Ofwat compared to other water companies, Thames Water will contribute to Ofwat's additional costs.[172]

[168][OF-OA-028] Ofwat, PR24 final determinations: Roadmap for enhancing asset health understanding in the water sector, December 2024, p.10
[169][OF-CA-011] Ofwat, Enhancing asset health understanding workstream
[170]Ofwat, PR24 redeterminations – expenditure allowances – addressing asset health, April 2025
[171] [OF-OA-025] Ofwat, PR24 final determinations: Expenditure allowances – Thames Water gated allowance appendix, December 2024, p.17
[172] [OF-OA-025] Ofwat, PR24 final determinations: Expenditure allowances – Thames Water gated allowance appendix, December 2024, p.18

Issues raised by Southern Water

9.12 Southern Water state the approach to capital maintenance is inconsistent with the company specific approach taken with Thames Water for its asset improvement gated allowance.[173] The company considers its cost adjustment claim was rejected despite the similar circumstances to Thames Water, and that it has not been given the same opportunity to strengthen the evidence base and access allocated funding.[174]

Our assessment

9.13 The provision of an asset improvement gated allowance for Thames Water represents a failure and lack of ability of the company to effectively manage its assets and put forward a robust cost adjustment claim. We expect Thames Water to contribute to Ofwat's additional costs given the large amount of work that the asset improvement dated allowance will involve.[175] The gated allowance is only to provide additional allowances above and beyond what is already funded through base expenditure allowances (ie what base buys). Where proposed expenditure overlaps with expectations from base expenditure, Thames Water must identify areas for potential shareholder contribution and this must be confirmed when consumer funding is confirmed.[176] A gated allowance for Southern Water would represent the same failure to effectively manage their assets and would be tied to the same conditions.

9.14 Southern Water has not provided sufficient evidence that there are material asset condition issues that need addressing immediately, and has also not proposed solutions to address such issues. This is in contrast to Thames Water who included specific evidence in their draft determination representations for where additional investment would be used given the poor condition of these assets.[177] This evidence provided by Thames Water led us to have immediate concerns with some of their assets that required addressing in this AMP. We also provided a gated allowance for Thames Water in PR19 of £300 million demonstrating the concerns we have historically had with the condition of their assets[178].

9.15 In addition, Southern Water does not appear to have sufficient understanding of the condition of its assets given the lack of evidence provided to demonstrate that specific assets are in poor condition and require additional investment. Instead the company focuses more on asset life. This is too simplistic as it does not take into account of factors that may extend or reduce expected asset lives. For example, refurbishment and renewals that extend asset life, or operating circumstances that reduce asset life. We consider that looking at asset condition and asset deterioration as well as considering asset lives provides a more holistic view of asset replacement requirements. Southern Water states it intends to deepen its understanding of the condition and health of the asset base and improve its

[173] [OF-OA-003] Southern Water, Statement of Case, March 2025, p.210, para. 381
[174] [OF-OA-003] Southern Water, Statement of Case, March 2025, p.211, para. 384
[175] [OF-OA-025] Ofwat, PR24 final determinations: Expenditure allowances – Thames Water gated allowance appendix, December 2024, p.18
[176][OF-OA-025] Ofwat, PR24 final determinations: Expenditure allowances – Thames Water gated allowance appendix, December 2024, p.33
[177] [OF-CA-075] Thames Water, DD – Asset improvement strategy, August 2024
[178] [OF-CA-079] Ofwat, PR19 final determinations Thames Water. p.36

asset management approach.[179] These findings could helpfully feed into the enhancing asset health workstream.

9.16 Overall, we consider the enhancing asset health understanding workstream / reopener is the best vehicle to consider the need for additional base expenditure allowances to address sector wide asset health issues. For example, companies have identified water storage assets and civil structures at treatment works as some of the assets to prioritise through this workstream, which Southern Water also supported.

Issue 3 – Insufficient base allowances

Our final determination

9.17 Our econometric cost benchmarking models form the starting point of our base expenditure assess by allowing us to quantify the relationship between costs and cost drivers, and assess relative efficiency between companies so that customers do not pay for efficiency. We incorporate a forward-look into our base cost assessment through the forecast cost drivers and cost adjustment claims. We introduced six forward looking sector wide adjustments at PR24. Two of these were focused on asset renewals: water mains and meters, with a total value of £1.2 billion.

9.18 Southern Water have a base allowance of £4.0 billion, which represents a 7.6% challenge on their draft determination representation request. This allowance is 3% higher than the company requested in their business plan in October 2023.[180]

Issues raised by Southern Water

9.19 Southern Water suggest it has overspent its totex allowances in AMP7 to meet the capital maintenance needs that arose. The company states the simultaneous overspend on cost allowances and underperformance against performance commitment levels suggest the PR19 base cost allowances were insufficient.[181]

9.20 The company includes analysis to suggest the difference between modelled allowances and actual amount spent has been increasing year on year. The company argues this trend exists across the sector and as a result cannot be attributed to inefficiency.[182]

9.21 Southern Water also state our approach lacks a forward looking element and as a result is not well suited to consider the 'effective health' of the asset base.[183]

[179] [OF-OA-003] Southern Water, Statement of Case, March 2025, p208, para. 375
[180] [OF-CA-021] Ofwat, PR24 base costs aggregator model, December 2024.
[181][OF-OA-003] Southern Water, Statement of Case, March 2025, para. 352
[182] [OF-OA-003] Southern Water, Statement of Case, March 2025, p.206, para. 372
[183] [OF-OA-003] Southern Water, Statement of Case, March 2025, p.202, para. 362

9.22 Southern Water reference the CMA's suggestion for Ofwat to enhance its analysis with a forward-looking element.[184] The company argue that we have not acted on this recommendation given PR24 base allowances, including capital maintenance, are only based on historical data. The company further argue that including forecast data in cost assessment is common regulatory practice, referencing our PR19 approach and the approach taken by Ofgem in RIIO-2.[185]

Our assessment

9.23 As stated in our water company performance report 2022-23, Southern Water has spent more on capital maintenance than was allowed during the 2025-30 period to address water quality risks and to improve wastewater treatment works compliance and pumping station performance.[186] It is important that companies address non-compliance issues within base expenditure allowances so that customers do not pay twice, ie once through the base cost models, and again through a cost adjustment. We are also providing Southern Water with additional allowances to address treatment work issues as part of PR24 enhancement funding.

9.24 We disagree that allowances have been insufficient to prevent asset condition deterioration for several reasons:

- Capital maintenance expenditure has increased by 3% per year in real terms (ie after adjusting for general inflation) since privatisation.
- Capital maintenance has increased over time after accounting for increases in population over time, and after accounting for increases in the size of the asset base as proxied by network length.
- Base expenditure allowances have also been close to company requested costs at PR19 and PR14. They were only 0.4 percent less than companies requested at PR19, and wholesale total expenditure allowances were only one percent less than companies requested at PR14.[187] [188] Southern Water's base expenditure allowance at PR19 was only 2.2 percent below what the company requested.
- Our analysis shows that asset condition has largely been maintained or improved since PR09 across water mains, gravity sewers, rising mains and bioresources assets.
- Our analysis shows that it does not necessarily cost more to deliver good performance. For example, cost efficient companies also perform well on performance.[189]

9.25 We recognise that companies have overspent on PR19 base expenditure allowances at the sector level at PR19. But this has primarily been driven by unexpected energy cost and supply chain cost increases.[190] Based on analysis setting the energy costs equal to those in 2020-21 to account for the uplift experienced at the end of the period, at a sector level the

[184] [OF-OA-003] Southern Water, Statement of Case, March 2025, March 2025, p210, para. 378
[185] [OF-OA-003] Southern Water, Statement of Case, March 2025, p.210, para. 380
[186] [OF-CA-080] Ofwat, WCPR 2022-23, September 2023, pp.28-29
[187] [OF-CA-020] Ofwat, PR19 Final determinations securing cost efficiency technical appendix, Table A1.2
[188] [OF-CA-092] Ofwat, PR14 Final determinations costs and revenue, December 2014, pp.35-36
[189] [OF-OA-022] Ofwat, PR24 final determinations: Expenditure allowances, December 2024, pp.277-278
[190] [OF-OA-022] Ofwat, PR24 final determinations: Expenditure allowances, 2024, pp.85

energy cost increase added £1030 million to company overspend for water and wastewater. This is equal to 3% of the total allowance[191]. During this time, capital maintenance expenditure has remained constant or has grown at a steady rates.

9.26 Southern Water's analysis, which shows the difference between modelled costs and actual costs is misleading as it includes the forecast period rather than just the historical period. Over the historical period (2011-12 to 2023-24), there are years where the model underpredicts sector wide costs, and overpredicts sector wide costs. This is what you may expect to see over time as companies balance peaks and troughs in base expenditure over time using a long-term efficient allowance. We do not expect the base cost models to be able to accurately predict expenditure in any given year. As noted above, much of the increase in costs in recent years is caused by unexpected input price pressures or events (eg atypical severe weather).

9.27 We disagree that we have not incorporated a forward look into our base cost assessment at PR24. We have achieved this through the cost driver forecasts and the six sector wide cost adjustments. We also provided clear guidance to companies in our PR24 methodology on the evidence required to justify a step-change in capital maintenance investment, which was developed in collaboration with water companies.[192] This followed engagement with companies through the cost assessment working group to identify additional information requirements that may help companies to prepare well evidence cost adjustment claims. We also set the catch-up efficiency challenge over the last five years to help ensure base expenditure allowances reflect latest efficiency evidence and sector wide cost pressures.

9.28 We are looking to develop additional asset health measures through the operational resilience working group which also aims to increase our oversight of companies' asset management approaches. These measure could inform our approach to future price controls. The enhancing asset health understanding workstream also provides a platform to explore potential improvements to our base cost assessment approach ahead of PR29.

9.29 Our assessing asset health response document sets out further detail on how we are actively engaged in evolving our approach to base cost assessment as we move forwards.[193] It also provides more detail on why base allowances for capital maintenance have been sufficient to maintain good asset health.

Issue 4 – Forward looking deterioration modelling

Issues raised by Southern Water

9.30 In their statement of case, Southern Water present new evidence from their Pioneer deterioration models. Southern Water state: "Pioneer has continuously predicted that there will be a peak in investment from AMP7 onwards, owed to the stock of assets reaching the

[191] [OF-CA-081] Ofwat, PR19 Spend versus allowance energy uplift.
[192] [OF-CA-001] Ofwat, Creating tomorrow, together: Our final methodology for PR24: Appendix 9 Setting expenditure allowances, December 2022, pp.50
[193] Ofwat, PR24 redeterminations – expenditure allowances – addressing asset health, April 2025

end of their design life." They further state that "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 in AMP8."

Our assessment

9.31 Southern Water provide new evidence of the change in average asset life for PR14, PR19 and PR24 from their Pioneer asset deterioration model.

9.32 There is inconsistency in the statement of case as to whether the table includes the "average asset life" (paragraph 374) or "average asset effective age" (table description 27). If it is the former measure, we do not consider average asset life is an appropriate asset health measure as it does not take into account the condition, operating condition or maintenance of the assets.

9.33 Southern Water provide no evidence or explanation to support the average effective asset lives from their Pioneer modelling. There is no evidence of:

- The inputs into the model, including sample size and whether it is representative of the asset base, how the information has been collected and verified, the age of the model inputs, and how new data is fed in.
- The methodology the deterioration model uses and how the model has been verified.
- The outputs of the deterioration model and how they have been used to develop the asset ages in table 27.
- Assurance of the deterioration model, either internally or by an independent assurer.

9.34 As a result, insufficient evidence is presented to demonstrate that the health of Southern Water's assets is deteriorating over time and that it requires the significant increase in base investment in AMP8 they have requested.

10. Wessex Water – Bioresources capital maintenance

Our final determinations

10.1 Wessex Water raised a cost adjustment claim for a £108 million step up in bioresources capital maintenance to deliver the meeting of new demands and asset health maintenance. This claim was not allowed in our final determination on the basis that Wessex Water did not provide compelling evidence on the need for an adjustment.[194]

[194] [OF-CA-230] Ofwat, PR24 FD CA19 Base cost adjustment feeder model- Wessex Water, December 2024, 'WSX_CAC5'.

Issues raised by Wessex Water

[redacted]

Our assessment

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[200] [OF-CA-262] The Dangerous Substances and Explosive Atmospheres Regulations 2002, Regulation 1

[redacted]

[202] [OF-CA-263] Health and Safety Executive, Control Of Major Accident Hazards Regulations 2015.

[redacted]

11. Wessex Water – Disinfection improvements

- Wessex Water request an additional £47 million to upgrade disinfection at selected water treatment works in line with guidance produced by the World Health Organization (WHO) and ongoing engagement with the DWI.
- This is a new cost adjustment claim. We consider that additional information is required to assess the need for a cost adjustment, and the cost efficiency of requested costs.
- We agree that the proposed investment is not funded through base expenditure allowances.
- It is unclear to us and the DWI why these proposed disinfection upgrades at water treatment works were not put forward as part of the established industry DWI PR24 programme.
- We suggest that Wessex Water follows due process for the assessment of these needs and associated requirements by engaging with the DWI in the first instance and agreeing to appropriate legal instruments. The following step would be for the CMA (or Ofwat) to carry out an assessment of cost efficiency and customer protection.
- If the investment is supported with legal instruments, and additional expenditure allowances are provided, it would be important to hold the company to account through a price control deliverable.

Our final determination

11.1 We allowed £2.0 billion for raw water deterioration and taste, odour and colour across the industry.[204] The allowance is divided into:

- Raw water deterioration (RWD) expenditure - which seeks to address a wide range of chemical and microbiological parameters such as nitrates, cryptosporidium and, per and poly fluoroalkyl substances (PFAS) risks that can affect raw water quality. This can involve a wide range of solutions such as ultraviolet treatment, ion exchange, adsorption, filtration and blending.

- Taste odour and colour (TOC) expenditure – which seeks to address customer acceptability of drinking water, specifically taste, odour and colour issues (such as iron, manganese, geosmin).

11.2 We used a combination of scheme level data benchmarking models and deep dives of individual schemes submitted to estimate allowances and we made an allowance of £37.8 million of the £39.9 million assessed for raw water deterioration to the company.[205] The company did not request any enhancement expenditure for taste, odour and colour and we made no allowance.

[204] [OF-OA-022] Ofwat, PR24 final determinations: Expenditure allowances, February 2025, p.210
[205] [OF-CA-022] Ofwat, December 2024, PR24 final determinations: Expenditure allowances, p.211,table 27

Issues raised by Wessex Water

11.3 In its statement of case, Wessex Water states the need for an additional investment of £47 million to upgrade its disinfection treatment methods at specific sites in line with guidance produced by the World Health Organization (WHO) and ongoing engagement with the DWI. The company refers specifically to the recommendation to categorise raw water solely on the concentration of *E.coli* risk. [206] The proposed investment was included in base expenditure in the company's business plan.

11.4 The company states the cost of this upgrade is not funded by the base costs models because, among other reasons, its water treatment complexity variables forecasts are based on the average of the last two years of outturn to avoid double counting new investment. Wessex Water therefore ask the CMA to allow this £47 million investment.[207]

Our assessment

11.5 In February 2025, we received new evidence from Wessex Water through our query process where the company stated the need for the additional £47 million funding for disinfection treatment. [208]

11.6 Following receipt of this query, we asked for additional information on the upgrades to be carried out at each site. We expressed our disappointment that this evidence was only being provided after the PR24 final determinations, as this prevented us from assessing as part of our final determinations against our cost adjustment claim criteria (need for adjustment, cost efficiency, customer protection) or enhancement assessment criteria (need, optioneering, cost efficiency and customer protection). [209]

11.7 We liaised with the DWI. It was unclear to them why these proposed disinfection upgrades at water treatment works were not put forward as part of the established industry DWI PR24 programme in January 2023 as the DWI had been engaging with the company throughout AMP7. [210] [211]

11.8 We concluded our query response by expressing our willingness to engage further with Wessex Water and the DWI on whether an additional allowance should be provided either separately or as part of the CMA redetermination process. We did not agree that a referral to the CMA was the most efficient and appropriate route as the company states in its statement of case.[212]

[206] '[OF-OA-004]Wessex Water, Statement of Case, March 2025, pp.33-36, para. 6.1-6.21
[207] '[OF-OA-004] - Wessex Water - statement of case', March 2025, pp.35-36, para. 6.20-6.21
[208] Query reference '[OF-CA-214]-OFW-FD-WSX-019'
[209] [OF-CA-001] Ofwat, Creating tomorrow, together: Our final methodology for PR24: Appendix 9 Setting expenditure allowances, December 2022, sections 2.4.2 and 2.4.3
[210] Price review process - Drinking Water Inspectorate
[211] Query reference '[OF-CA-214]-OFW-FD-WSX-019'
[212] [OF-OA-004] Wessex Water, Statement of Case, March 2025, p.33, para. 6.3

11.9 We suggest that Wessex Water follows due process for the assessment of these needs and associated requirements by engaging with the DWI in the first instance and agreeing to appropriate legal instruments. The following step would be for the CMA (or Ofwat) to carry out an assessment of cost efficiency and customer protection.

11.10 This would help ensure that there is no potential benefit for Wessex Water in avoiding the normal price review processes and scrutiny, and encourage all companies to follow them in the future.

11.11 If following engagement with the DWI, the investment need is supported with legal instruments, and additional expenditure allowances are provided, it would be important to hold the company to account through a price control deliverable.

12. South East Water – Economies of Scale at Water Treatment Works

- **South East Water submitted a cost adjustment claim of £25 million for the additional costs it considers it faces due to operating small water treatment works (WTWs), and therefore are not able to benefit from economies of scale (EoS) compared to other companies.**
- **We partially accepted the company's cost adjustment claim at final determinations. But the company has requested an additional £9.7 million. We consider our decision at final determinations remains appropriate based on the new information provided.**
- **We accepted the unique circumstances faced by South East Water, Southern Water and Wessex Water in terms of number of sources per population (top three companies), meaning they could not benefit from economies of scale in water treatment. We also agreed this was unlikely to be captured by population density and water treatment complexity.**
- **We developed an independent view of the value of the cost adjustment by including a water weighted average treatment size variable in all the water resource plus base cost models.**
- **We only included the water weighted average treatment works size variable in the water resources plus models for the purpose of calculating the cost adjustment as this is where we expected the water-WATS variable to have the largest impact (i.e. it primarily affects water treatment costs).**

Our final determination

12.1 South East Water submitted a cost adjustment claim for the additional costs it considers it faces due to operating small water treatment works (WTWs), and therefore not being able to benefit from economies of scale (EoS) compared to other companies.

12.2 South East Water requested a cost adjustment of £25 million for water network plus.

12.3 We considered that economies of scale at water treatment works are partially captured by other drivers, in particular the density and treatment complexity drivers. Our analysis showed than there are three outlier companies when looking at the correlation between density and water treatment works size, including South East Water. This supported the need for an adjustment for these companies.

12.4 We also considered the size and location of water resources is a key determinant of the number and size of WTWs from an engineering perspective, more so than where population clusters are located. South East Water is in the top three companies in terms of the number

of water resources (measured as the number of sources per population served). This indicates that the size of the WTWs is largely outside of the control of the company and is driven by the large number of relatively small water sources. The company is also in the top three in terms of smallest water treatment works size.[213]

12.5 We therefore concluded the company provides compelling evidence to justify the need for a cost adjustment due to the base cost models failing to capture the unique circumstance of the company.

12.6 We developed an independent view of the value of the cost adjustment by including a water weighted average treatment size variable in all the water resource plus base cost models based on the approach suggested by Southern Water in its economies of scale at water treatment works cost adjustment claim. The water weighted average treatment size (WATS) variable was similar to the WATS variable used in the wastewater base cost models. We calculated the adjustment value based on the difference between wholesale water base allowances including and excluding the water-WATS variable.

12.7 We had some concerns regarding the robustness of the water-WATS driver, but we decided to apply a cost adjustment to South East Water based on this approach given the strong engineering rationale,. The variable performed better from a statistical perspective compared to other economies of scale variables tested.

12.8 Our approach led to an allowed cost adjustment of £14 million for South East Water compared to the requested cost adjustment claim of £25 million.

Issues raised by South East Water

12.9 South East Water claims that Ofwat's analysis was only partial in scope, as it focused only on the water resource plus (WRP) models and omitted the impact on wholesale water (WW) models entirely. It suggests that if Ofwat were to include the WW models into its analysis, the cost adjustment value increases from £14.3 million to £24 million, which is similar to its original cost adjustment claim submission.[214]

12.10 South East Water commissioned an Oxera report to assess the base cost adjustments and cost adjustment claims, including WTW-level economies of scale.[215]

12.11 Oxera claims that Ofwat is inconsistent to not include WATS in the WW models, due to this driver performing poorly in these models. It notes that while the driver is statistically insignificant in all WW models, it is also statistically insignificant in all but one of the WRP models. Additionally, in terms of p-value, three WW models are better performing than the worst WRP model.[216] It therefore concludes that if the WW models are insufficiently robust,

[213] [OF-CA-009] Ofwat, Base cost adjustment claims feeder models, December 2024, South East Water, 'SEW_CAC2' .
[214] [OF-0A-005] South East Water, Statement of Case, March 2025, p.41.
[215] [OF-CA-048] South East Water, Oxera, Base cost adjustments and cost adjustment claims, March 2025, p.14
[216] [OF-CA-048] South East Water, Oxera, Base cost adjustments and cost adjustment claims, March 2025, p.16

the WRP models also are. Oxera also shows that the standard errors on the estimated coefficient on WATS is lower in all WW models compared with their equivalents WRP model.

12.12 Oxera concludes that the omission of the WW models is inappropriate, and the cost claim should be extended to include these models, increasing the value of the cost adjustment to £24 million.

Our assessment

12.13 At final determination we had concerns regarding the robustness of the water-WATS driver. We concluded that the water-WATS driver is statistically significant in 1 of the 6 WRP models (at the 10% significance level) and the p-value for the rest of the WRP models was around 0.2.[217] The water-WATS driver is statistically insignificant in all the WW models, with a p-value around 0.4.

12.14 The lack of statistical significance in both the WRP and WW models meant we did not consider the water-WATS variable produces sufficiently robust results to be included in the base cost models to help set base expenditure allowances for all companies. The variable was also suggested by Southern Water late in the PR24 process, so other companies did not have the opportunity to fully engage with the proposal.

12.15 But we accepted the need for adjustment for economies of scale at WTWs for a small number of companies due to the strong engineering rationale. Despite our concerns with the statistical performance of the water-WATS driver in the base cost models, this variable performed better from a statistical perspective compared to other economies of scale at WTWs variables tested. For example, number of sources per distribution input and % of distribution input treated in different size treatment bands.[218] We also considered that companies did not suggest a more robust proposal. We stated our intention to explore, with the sector, whether we can potentially better capture economies of scale at WTWs in the wholesale water base cost models at PR29.

12.16 We only included the water weighted average treatment works size variable in the water resources plus models for the purpose of calculating the cost adjustment as this is where we expected the water-WATS variable to have the largest impact (ie it primarily affects water treatment costs, which are 85 percent of water resources plus base costs but only 44 percent of wholesale water base costs). Southern Water also applied this approach in its economies of scale in water treatment cost adjustment claim, which recognizes the poor statistical performance of the water-WATS variable in the wholesale water models.

12.17 As the econometric results suggested that the overall impact on the costs is not statistically different from zero, we decided to apply the adjustment in-the round as we recognized the unique operating circumstances faced by South East Water, Southern Water and Wessex

[217] The p-value of the statistically significant coefficient on water-WATS is 0.077, while the other five regressions have p-values of 0.235, 0.279, 0.111, 0.195 and 0.234.
[218] [OF-CA-102] CEPA, PR24 Wholesale Base Cost Modelling', April 2023, pp.36-37

Water (ie relatively high number of water sources due to location of water sources) was unlikely to be explained by the population density and treatment complexity variables included in the models. Therefore, we remain of the view that our decision to partially accept South East Water's economies of scale at water treatment works cost adjustment claim is appropriate.

Ofwat (The Water Services Regulation Authority) is a non-ministerial government department. We regulate the water sector in England and Wales.

Ofwat
Centre City Tower
7 Hill Street
Birmingham B5 4UA
Phone: 0121 644 7500

This document is also available from our website at www.ofwat.gov.uk.

Any enquiries regarding this publication should be sent to mailbox@ofwat.gov.uk.

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