

February 2025

PR24 final determinations: Expenditure allowances

Amendment	Date
Page 39, table 4 incorrectly listed Anglian's adjustment (£144.4m) to base allowance against Welsh.	20/12/25

Summary

Companies have proposed around £112 billion of expenditure for PR24 (price review 2024) in their representations.¹ This is a significant increase in expenditure compared to previous price controls and a £7 billion increase on their business plans.

Our PR24 expenditure allowances are up to £104 billion, including contingent allowances. This represents a 71% increase in expenditure compared to PR19. We challenge companies' proposed expenditure where there is insufficient evidence that:

- expenditure is efficient;
- enhancement expenditure does not overlap with base expenditure;
- expenditure has not been previously funded; or
- expenditure is required.

Our overall expenditure challenge to company representations is 7%. This is slightly greater than the 5% challenge at PR19 final determinations. This challenge reflects the greater proportion of enhancement expenditure at PR24 compared to PR19 where some companies have proposed significantly higher costs than others to deliver comparable improvements. Our final determinations reflect a £16 billion increase in allowances compared to our draft determinations. Our increase in allowances reflects a £7 billion increase in company requests – which reflects additional requirements from Defra, the Environment Agency, Natural Resources Wales and the Drinking Water Inspectorate; additional evidence from companies; and improvements to our cost assessment approach. We consider that this expenditure allowance is sufficient for all companies to meet their statutory and regulatory requirements and deliver their performance commitments over the 2025–30 period, if operating efficiently.

¹ After the application of frontier shift efficiency and real price effects. Before the deduction of developer services revenue.

Table 1: Proposed PR24 expenditure allowances

Company	Base expenditure		Enhancement expenditure		Total expenditure (before frontier shift and real price effects)		Total expenditure (after frontier shift and real price effects)	
	Company proposal	Our view	Company proposal	Our view	Company proposal	Our view	Company proposal	Our view
Anglian Water	6,465	6,121	5,002	5,092	11,467	11,213	11,180	10,971
Dŵr Cymru	3,519	3,667	2,568	2,462	6,088	6,129	6,021	5,997
Hafren Dyfrdwy	236	221	53	51	289	272	269	266
Northumbrian Water	3,900	3,614	2,801	2,660	6,701	6,274	6,365	6,153
Severn Trent Water	8,779	8,554	7,207	6,679	15,986	15,233	15,689	14,917
South West Water	2,308	2,326	1,756	1,602	4,064	3,928	3,941	3,847
Southern Water	4,150	4,080	5,222	4,618	9,373	8,698	9,614	8,530
Thames Water	14,465	12,575	10,282	8,299	24,746	20,874	24,467	20,464
United Utilities	7,296	7,545	6,911	6,043	14,206	13,587	14,027	13,312
Wessex Water	2,533	2,232	2,628	2,100	5,161	4,332	5,086	4,231
Yorkshire Water	5,428	5,479	3,078	3,046	8,506	8,525	8,345	8,345
Affinity Water	1,687	1,700	715	692	2,402	2,392	2,404	2,341
Bristol Water	575	586	192	139	768	725	745	709
Portsmouth Water	252	268	217	212	469	479	458	471
South East Water	1,371	1,282	770	580	2,141	1,862	2,104	1,821
South Staffs Water	729	779	152	167	881	946	882	926
SES Water	361	328	59	47	420	375	428	367
Total	64,055	61,356	49,613	44,489	113,668	105,845	112,026	103,667

Our approach

We want to set the appropriate expenditure allowances to achieve two key considerations:

- We want customers to get value for money, by not paying for inefficiency and not paying twice for investment.
- We also want companies to have sufficient funding to maintain asset health, provide a good level of service, and deliver improvements to customers and the environment.

We seek to achieve both considerations through our approach to cost assessment. Where possible, we benchmark expenditure. This allows us to compare expenditure across companies and schemes, and with historical expenditure and external benchmarks, to identify where expenditure is inefficient. Where benchmarking is not possible, we undertake bespoke assessments, using engineering and water sector expertise to evaluate whether expenditure is justified, appropriate optioneering has been undertaken, and costs are efficient.

We separate our expenditure assessment into our assessment of base and enhancement expenditure.

- Base expenditure – routine, year on year expenditure to deliver a base level of good service to customers and the environment and maintain the long-term capability of assets.
- Enhancement expenditure – generally where there is a permanent increase or step change in the current level of service to a new 'base' level and/or the provision to new customers of the current service level. It may be driven by new statutory obligations, by improving service quality and resilience, or by providing new solutions for water provision in drought conditions.

Our PR24 approach to cost assessment builds on what we did at PR19 by including more of a forward-looking component to our scrutiny of base expenditure and greater use of historical and more disaggregated data in our scrutiny of enhancement expenditure.

Maintaining long term asset health

We allow funding to water companies to maintain the long-term capability of their assets through base expenditure allowances. Base expenditure allowances are 19% higher than at PR19, and 7% more than companies have spent in the last five years. We expect companies to use this increased expenditure to maintain and improve the health of their asset base, taking into account the impact of climate change over the long-term.

Capital maintenance expenditure has increased by 23% in real terms since 2011-12, and companies' performance against asset health performance commitments has improved.² However, even though we have not seen an increase in mains bursts or evidence of a decline in asset condition, we have been concerned that companies' mains replacement levels have fallen to just 0.1% a year. This is self-evidently too low and is far lower than the level implicitly funded through PR19 base expenditure allowances. We are therefore setting an expectation that all companies replace at least 0.3% of their water network each year through base allowances. If companies have allowed asset condition to deteriorate, we expect companies to replace more than 0.3% a year without additional funding. We have also increased base allowances where we consider a company needs to replace more than 0.3% of its water network each year to improve asset condition. We have provided further funding in enhancement allowances to replace mains.

Overall, we expect companies to replace 8,445km of water mains during the 2025-30 period with base and enhancement expenditure allowances. This equates to the replacement of 2.4% of the sector's total length of mains by 2029-30, at an average rate of 0.45% per year.

² We reported 9% growth in our draft determination. However, this represented the growth in wholesale water only. Combined wholesale water and wastewater growth between the 2011-12 to 2022-23 period was 16%.

Our analysis shows that asset condition has largely been maintained or improved since PR09 across water mains, gravity sewers, rising mains and bioresources assets. We have developed a plan for the next five years (2025–30) that gain greater insight into the condition of a wider range of assets before PR29. As part of this, we will assess if there are any sector wide asset condition issues that need to, and can be, addressed ahead of PR29 and whether additional funding is required.

Accommodating growth

We want the water sector to support economic growth. To facilitate this, we are providing a significant increase in expenditure allowances to accommodate population growth and increased business demand compared to previous price reviews. This will allow companies to keep maintaining and improving the quality of service.

Our base expenditure allowances reflect anticipated increases in population and include funding to provide and upgrade water and sewerage network assets to accommodate larger populations including by facilitating new developments (known as network reinforcement). We received claims for six companies for an increase in network reinforcement spend over and above the allowance included within base expenditure allowances. To accommodate growth across the network, we are providing a sector adjustment of £0.7 billion for companies to undertake additional network reinforcement. We will claw back this expenditure if it is not used on network reinforcement. We also allow around £1.4 billion for site-specific developer services (service connections and on-site mains) that is excluded from the price control as developer services are funded from revenue outside the price control. This is because customers' needs and interests are protected by competition, our charging rules and competition law.³ This will support economic growth and help to facilitate the Government's target to build 1.5 million new homes over the next five years.

We assess investment to increase capacity at sewage treatment works separately from base costs at PR24. To improve our cost assessment, we collected additional data on permits at sewage treatment works that are impacted by population growth that drives investment requirements. We allow companies £1.8 billion to increase capacity at sewage treatment works to accommodate population growth over the 2025–26 to 2029–30 period. This includes a reduction in costs for companies that have historically under-delivered capacity increases at sewage treatment works so that customers do not pay twice. Any improvements required to address current non-compliance against existing permits must be addressed by companies, and we will not allow customers to pay for this. Ofwat and the Environment Agency are taking enforcement action against companies to address any issues of non-compliance.

³ Only applies to wastewater site-specific developer services for Welsh companies. Competition in water site-specific developer services is not yet widespread in Wales, and we do not have powers to establish charging rules to protect developer services customers in Wales

Increasing resilience

We expect companies to provide resilient water and wastewater services. To facilitate this, we allow over £1.5 billion to improve resilience in PR24, more than double the allowance in PR19. We expect companies to use this increased expenditure to deliver a step change in resilience. As a key part of this, we want companies to improve resilience to climate change. We therefore provide additional expenditure allowances of £300 million to improve resilience to climate change, in particular resilience to power interruptions and flooding, which will help support the national flood and coastal erosion management strategies for England and for Wales. We are also providing £455 million to increase cyber security resilience and £747 million to improve the physical security of critical sites and provide emergency water supplies.

Other expenditure will also contribute to increased resilience. Our increased base expenditure allowances will allow companies to improve resilience through better asset health, for example through our increased expectations on mains renewals. Our more than £8 billion of expenditure to improve water supply and reduce water demand, although predominantly to allow the abstraction reductions identified by environmental regulators, will also significantly improve resilience to droughts.

A step change in enhancement and environmental improvement

We are providing a step change increase in enhancement expenditure allowances of up to £44 billion to improve services to customers and the environment. This is around four times the level in PR19. Nearly 90% of this expenditure is driven by legal requirements specified in water resources management plans and by the environmental programmes of the Environment Agency and Natural Resources Wales, the Drinking Water Inspectorate and other statutory drivers such as the Industrial Emissions Directive.

We are providing expenditure allowances for the delivery of all environmental actions set out by the Environment Agency and Natural Resources Wales. This investment in the WINEP/NEP will support over 28000 actions to improve the environment. This includes:

- Around 2000 actions to address water sector related reasons for declining condition or failure to meet good condition for water bodies.
- Actions to improve the condition of 15,000km of rivers.
- Fitting monitors around 7,000 emergency overflows and water company discharges
- Taking action at 15 bathing waters to reach 'good' or 'excellent' status and 27 newly designated bathing waters
- Around 900 actions to improve, investigate and protect sites of scientific interest and European sites

As part of the WINEP/NEP, we provide for £11.3 billion of expenditure to improve storm overflows. This will fund improvements to 2,884 storm overflows and remove over 111,000 spills by 2029 when compared to 2025. Following our letter to the sector in 2022, companies are proposing to reduce spills by an average of 21% by 2025 without additional funding. Reflecting the impact of enhancement expenditure, companies propose to reduce spills by 41% by 2029. We are proposing to push companies further, to an average reduction of 25% in spills by 2025 and 45% by 2029.

We also allow £6 billion to remove nutrients from water bodies to meet WINEP/NEP requirements. This is around twice the expenditure in PR19 and should fund a reduction in phosphorus at around 1000 sites and catchments. We propose to fund reductions in nitrogen at 66 sites.

We allow more than £8 billion on water supply and demand to fund companies to deliver all the needs set out in water resource management plans. This will allow companies to start to build nine new reservoirs, 12 water recycling plants, and deliver over 500 km of interconnectors. This investment will improve companies' water supplies in drought. We are allowing customer funding or part funding for the delivery of supply schemes that will provide 912 Ml/d of benefit, with 349 Ml/d of this delivered in 2025-30. This investment will also help reduce demand through the delivery of 10.4 million smart meters over 2025-30 supporting companies to reduce leakage by 13% and per capita consumption by 4%.

Dealing with uncertainty

While we set expenditure allowances, companies' actual expenditure will depend on a range of factors such as efficiency, changes to the costs of labour and materials, changes to scheme scope and other external and internal factors. To help deal with cost uncertainty we allow companies to share overspending and underspending with customers. This reduces risks to both companies and customers. In certain circumstances companies can also request we reset a price control through an interim determination, including under a so-called substantial effect clause.

Given recent energy and input price rises and the large increase in enhancement expenditure, we are increasing the scope of risk protection mechanisms in PR24. In addition to the existing labour cost adjustment, we are proposing to include true-ups for external energy price changes for base expenditure and materials, plant and equipment costs for enhancement expenditure. Overall, we estimate that around 55% of total expenditure will be covered by true-ups related to external input price factors.

Enhancement expenditure can be more uncertain than base expenditure because, for example, schemes can be more bespoke. Companies can manage some of this where they have a large portfolio of schemes, but some residual risk is likely to remain. To help manage this risk we are reducing company cost sharing rates on enhancement expenditure to 40% of

overspending and underspending. This will provide customers with a greater share of the benefit if companies spend less than allowances. However, companies will be exposed to less of the overspend if costs increase above allowances.

We are introducing uncertainty mechanisms that could allow companies additional revenue over the 2025–26 to 2029–30 period if there are any new or changed legal requirements on cyber security or changes in relation to the level of threat, additional PFAS requirements for drinking water or new or changed legal requirements or statutory guidance or governmental directions to regulations help to drive a transition away from sludge to land. Cost uncertainty for large enhancement schemes can be relatively high. Large scheme costs can be affected more by changes in scope and are also more likely to require planning approvals and additional investigations and other requirements. For less complex large schemes (schemes which cost more than £100 million in 2025–30) together with some areas where we have significant uncertainty such as the costs of meeting the Industrial Emissions Directive, we are proposing to reduce company cost sharing rates to 25%. This will increase company incentives to deliver schemes in full, by reducing company benefits from underspending and costs from overspending.

Overall, over £7.5 billion of expenditure will be subject to enhanced cost sharing rates. Where schemes are complex, for example schemes are novel or there is significant uncertainty over project scope, then cost uncertainty can increase. For complex large schemes over £100 million, we are gating expenditure allowances, and provide only development funding in PR24 allowances. Companies will be able to recover additional costs at the 2029 price review (PR29) following an in-period assessment by Ofwat. We also make some construction funding for Thames Water contingent on schemes proceeding. We propose that £2.4 billion of potential expenditure will be contingent across complex large schemes, strategic resource options and PFAS areas.

Encouraging delivery

Delivering the increase in enhancement expenditure is likely to be a challenge for water companies. While delivery remains the responsibility of companies, we are proposing a range of measures to both encourage and facilitate companies to deliver their plans and protect customers if they do not.

To encourage companies to increase their delivery of their PR19 programme, we have increased the visibility of the delivery of the PR19 enhancement programme through the water company performance report and by asking those companies that are furthest behind to develop action plans.

To encourage an early start on PR24 enhancement investment, we have expanded the scope of the PR24 transitional expenditure programme to cover 2023–24 as well as 2024–25 and in June 2023 we approved the acceleration of 33 schemes, so that companies could make an

early start on their PR24 programmes. In total we are approving £1.2 billion of PR24 expenditure to be delivered in 2023-25.

To increase companies' focus on deliverability, we made deliverability a key part of our assessment of the quality of companies' business plans; an assessment that has financial rewards and penalties attached. This included companies providing their Boards' assurance on the ability of the company and its supply chain to expand its capacity and capability at the rate required to deliver the increased investment, and key risks and constraints.

Direct procurement for customers (DPC) improves value for money by increasing competition in the delivery of large infrastructure projects, by encouraging competitive procurement for more aspects of a project, including financing. In our PR24 methodology, we stated that DPC will apply by default for all discrete projects above a size threshold of £200m of whole-life total expenditure. We also stated we remain supportive of companies exploring the use of Specified Infrastructure Projects Regulations (SIPR) as an alternative to DPC. Our final determinations allow for an additional 27 DPC/SIPR projects (most of which are associated with strategic water resource options), in addition to the existing projects we are progressing.

We are introducing price control deliverables to hold companies to account for the outputs and outcomes that they propose to deliver and to return money to customers if companies do not deliver these in full. We are introducing incentives to encourage companies to deliver on time, so that programmes do not get pushed to the end of the period.

Improving performance

We are providing significant funding to water companies to deliver improved performance. Our expenditure allowances for storm overflows should lead to a 44% reduction in storm overflow spills. We are providing around £0.7 billion of leakage enhancement allowances and over £1.7 billion for delivery of millions of smart meters to support companies to reduce leakage and reduce per capita consumption.

We have improved the link between costs and service at PR24 by using a more structured framework to set performance commitment levels, and explicitly and separately considering the impact of base and enhancement expenditure on performance. We are setting performance commitment levels so they are consistent with the expected performance of efficient companies.

We are allowing funding for reductions in sewer flooding through our base expenditure allowances. Other expenditure allowances should help water companies meet other performance commitments. Our additional allowances for mains renewals should help companies reduce the need for mains repairs. Our expenditure on resilience and

interconnectors should help companies reduce water supply interruptions. Expenditure on storm overflows should help to reduce pollution incidents.

Not paying twice

We have put in steps to prevent customers from paying twice. We have removed expenditure requested by companies that is already covered in base expenditure allowances such as the replacement of end-of-life assets. We have removed expenditure which has previously been funded, for example on water resources management plans, Water Industry National Environment Plan/National Environmental Plan (WINEP/NEP) and growth at sewage treatment works. We are excluding funding for storm overflows where it has been previously funded, for example to meet existing permit levels.

Overall, around 30% of our enhancement cost challenge is removing schemes which we consider should be funded through base expenditure allowances, with a further 10% from the removal of schemes previously funded. A large part of this is from Thames Water.

Encouraging nature-based solutions

Nature-based solutions can deliver direct improvements to the environment, for example by reducing spills from storm overflows, but can also deliver wider benefits such as increased biodiversity and reduced use of carbon.

We have encouraged the use of nature-based solutions, through our PR24 methodology.

- We have encouraged companies to deliver best value and consider wider benefits so that companies do not just deliver grey solutions.
- We have benchmarked nature-based solutions separately to grey solutions where they might cost more so that green solutions are not disadvantaged.
- We are setting a ten-year allowance for non-traditional solutions which are wholly or primarily funded by operating, rather than capital, expenditure. This will help ensure a more level playing field for funding of operational and capital solutions, which will help to benefit some forms of nature-based solutions.

In total we are proposing to allow around £3.3 billion to deliver nature-based solutions. This includes £2.6 billion of the £11.3 billion to reduce storm overflow spills through catchment and nature-based solutions. These include the use of green solutions such as sustainable urban drainage as well as wetlands and reed beds. We are setting expected outputs from expenditure on storm overflows on the basis of equivalent storage volume, not grey storage volume. This will help companies maximise the use of catchment and nature-based solutions when delivering them. We encourage companies to take advantage of the flexibility in our approach and work with environmental regulators to secure their approval to move further towards nature-based solutions.

This £3.3 billion also includes around £250 million for catchment and nature-based solutions for nutrient removal. This includes catchment and nutrient balancing as well as reed beds and wetlands.

We are proposing to allow £259 million to fund the Advanced WINEP in AMP8. The Advanced WINEP allows innovative approaches that are not possible within the standard WINEP, and which could secure better outcomes for customers and the environment and inform approaches for future WINEPs. This includes funding for Anglian Water to set up a Partnership Centre of Excellence to encourage nature-first solutions, South East Water to implement innovative catchment approaches to reduce nitrates entering groundwater, and United Utilities to put in place 58,000 m³ of equivalent storage through rainwater gardens, swales, permeable paving and natural flood risk management.

As noted above, we are also proposing to set price control deliverables flexibly so that companies can choose to deliver more nature-based solutions in period. We encourage stakeholders to engage with companies to identify areas where additional nature-based solutions can be delivered. We expect companies to publish full details of their proposed environmental investment programmes soon after final determinations to enable stakeholders to engage with them.

Making progress to net zero

We are supporting companies to deliver net zero through our net zero challenge funding. This will provide an additional allowance of £0.5 billion to Anglian Water, Dŵr Cymru, Hafren Dyfrdwy, Severn Trent, United Utilities, Wessex Water, and Yorkshire Water. This will fund 33 schemes to deliver innovative projects to understand better how to reduce emissions. These schemes are mainly focused on reducing process emissions from the treatment of wastewater through a range of approaches.

The funding includes £34 million for peatland restoration schemes and £1 million for a nature-based catchment project. Together these schemes will help companies to better understand and reduce greenhouse gas emissions, with learnings shared across the sector.

We also provide an additional base expenditure allowance of around £66 million to enable companies to invest in the infrastructure needed to adopt low carbon technologies critical to the reduction of emissions from the use of vehicles and heating.

Alongside this additional allowance, we will be continuing to push the sector to reduce emissions through our operational greenhouse gas emissions performance commitment, as well as approving company proposals for bespoke performance commitments on embedded emissions. Incentivising company action on embedded emissions, particularly as it relates to capital expenditure, is critical to enabling the sector to achieve net zero.

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1. Introduction

Our view of efficient total expenditure (totex) allowances for water and wastewater companies is made up of base and enhancement expenditure.

Base expenditure covers wholesale and retail activities and includes:

- routine, year-on-year costs, which companies incur in the normal running of their businesses to provide a base level of good service to customers and the environment;
- expenditure on maintaining the long-term capability of assets;
- expenditure to improve efficiency; and
- expenditure to comply with current legal obligations.

Enhancement expenditure is generally where there is a permanent increase or step change in the current level of service to a new 'base' level and/or the provision to new customers of the current service level. Enhancement funding can be for environmental improvements required to meet new statutory obligations, improving service quality and resilience and providing new solutions for water provision in drought conditions.

Water companies are monopoly providers of most water and wastewater services. We cannot rely on competition to deliver efficient costs and good service quality for customers. We therefore use regulatory tools to incentivise companies to reveal efficient costs and reduce information asymmetry between ourselves and water companies. This protects customers from overpaying.

The building blocks of our PR24 totex assessment are set out in the table below.⁴

Table 2: Building blocks of our PR24 totex assessment

	Building block	Sub-component	Assessment approach
Base expenditure	• Modelled base costs	• Wholesale water • Wastewater network plus • Bioresources • Residential retail	• Econometric benchmarking models using historical data. • Sector wide cost adjustments for energy costs, mains renewals, meter renewals, phosphorus removal, and net zero. • Assessment of cost adjustment claims. • Catch-up efficiency: historical upper quartile benchmark . • Real price effects: labour and energy. • Frontier shift efficiency: 1% a year.

⁴ For final determinations, we have assessed Environment Agency water quality permit costs as part of unmodelled base costs instead of modelled base costs given the forecast step-change in costs over the 2025-30 period.

	• Unmodelled base costs	• Business rates • Abstraction and discharge charges (water) • Traffic Management Act (TMA) and lane rental scheme costs • Industrial Emissions Directive operating costs (wastewater) • Pension deficit recovery costs • Third-party services costs and diversions (price-control) • Water site-specific developer services (Dŵr Cymru and Hafren Dyfrdwy only) • Non-household retail (Dŵr Cymru and Hafren Dyfrdwy only)	• Bespoke assessment for each cost category. • Catch-up efficiency challenge: only applied to TMA, lane rental and water site-specific developer services costs. Based on gap between allowed and requested modelled base costs and capped at 10%. • Labour real price effect and frontier shift efficiency of 1% a year applied to TMA costs, lane rental costs, and non-household retail costs.
Enhancement expenditure	• Wholesale water enhancement • Wastewater enhancement	• Water industry national environment programme (WINEP) in England and the national environment programme (NEP) in Wales • Resilience and security • Net zero • Supply-demand balance and metering • Drinking water quality improvements • Growth at sewage treatment works • Other	• Unit cost and econometric benchmarking models using a combination of historical and forecast information. • Engineering shallow- and deep-dive assessments. • External cost benchmarks.

We split the totex allowance across up to six price controls for each company:⁵

- water resources;
- water network plus control;
- wastewater network plus control;
- bioresources control;
- residential retail control; and
- business retail control for Welsh water companies.

We also set separate controls for major projects which are company specific, which are discussed in section 4:

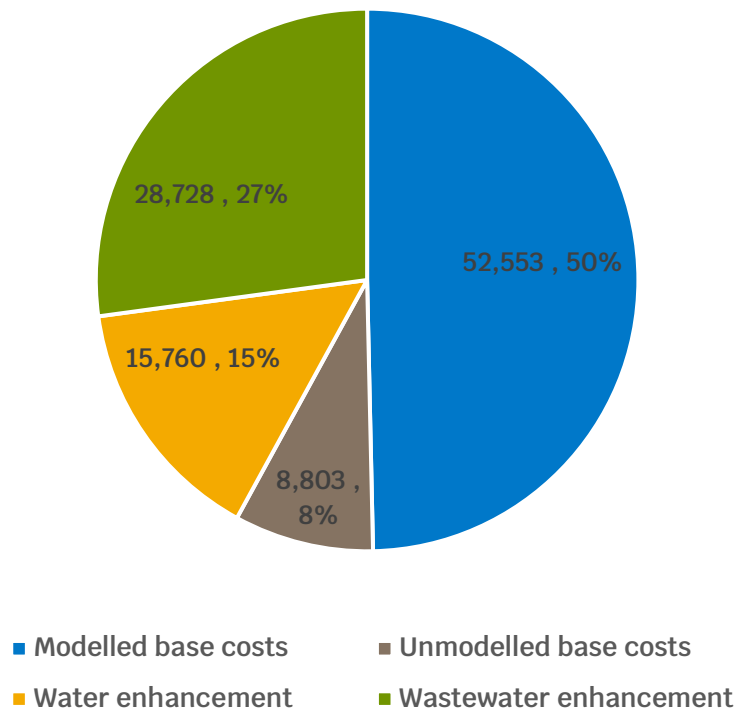
- Tideway wastewater control for Thames Water only; and
- Havant Thicket water control for Portsmouth Water only.

To aid comparison with company proposals for this document, efficient totex allowances are reported before the deduction of developer services revenue (i.e. gross totex). Allowances are also reported before the application of frontier shift efficiency and real price effects unless otherwise stated.

⁵ And within each company. For example, we set separate wholesale expenditure allowances for the South West area and Bristol area of South West Water.

We provide an overview of efficient totex allowances before frontier shift efficiency and real price effects in Figure 1 below, which sum to around £106 billion.

Figure 1: makeup of efficient totex allowances before frontier shift efficiency and real price effects (£ million 2022-23 prices)



Before the application of frontier shift efficiency and real price effects:

- **Totex allowances (base + enhancement)** – we allow £105.8 billion of expenditure, including contingent allowances. This is 7 percent below companies' requested expenditure in draft determination representations of £113.7 billion, and 16 percent higher than our draft determination totex allowances.
- **Base expenditure allowances** – we allow £61.4 billion. This is 4 percent below companies' requested base expenditure in draft determination representations of £64.1 billion, and 9 percent higher than our draft determination base expenditure allowances.
- **Enhancement expenditure allowances** – we allow £44.5 billion. This is 10 percent below companies' requested enhancement expenditure of £49.6 billion, but 29 percent higher than our draft determination enhancement expenditure allowances.

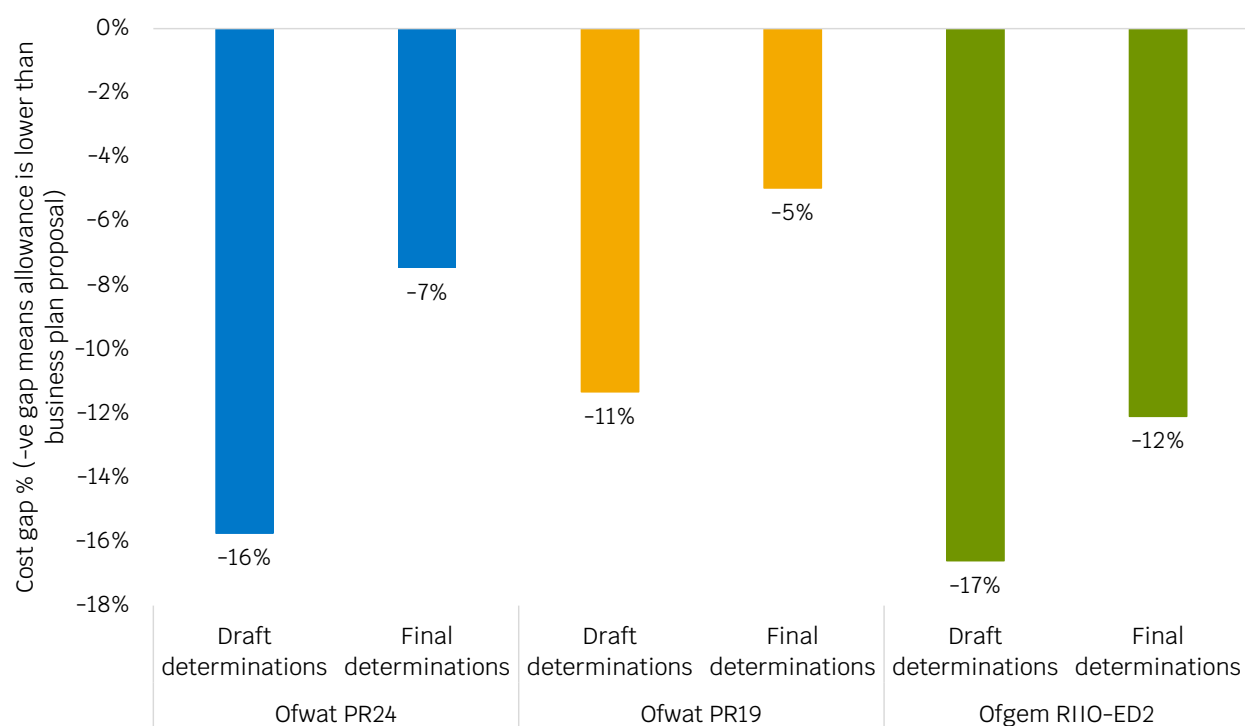
The key factors driving the changes in our expenditure allowances between draft and final determinations are:

- **A £6.8 billion (5%) increase in company requested totex** – £3.2 billion on base expenditure and £3.6 billion on enhancement expenditure. The increase in requested base expenditure is mostly because of additional capital maintenance and network reinforcement requests. The increase in requested enhancement expenditure is mostly driven by increased requirements from Defra, the Drinking Water Inspectorate (DWI), National Resources Wales and the Environment Agency; and increased project scope.
- Additional base allowances for **energy costs, business rates, network reinforcement, bioresources growth** and **mains renewals**.
- Additional enhancement allowances for **storm overflows, strategic resource options, raw water deterioration** and **growth at sewage treatment works**.

The allowances received by companies will be after the application of frontier shift efficiency and real price effects:

- **Totex allowances (base + enhancement)** – we allow £103.7 billion of expenditure, including contingent allowances. This is 7 percent below companies' requested expenditure in draft determination representations of £112.0 billion, and 18% higher than our draft determination totex allowances.
- **Base expenditure allowances** – we allow £60.1 billion. This is 5 percent below companies' requested base expenditure in draft determination representations of £63.1 billion, and 10% higher than our draft determination base expenditure allowances.
- **Enhancement expenditure allowances** – we allow £43.6 billion. This is 11 percent below companies' requested enhancement expenditure of £49.0 billion, but 30% higher than our draft determination enhancement expenditure allowances.

Figure 2 below compares the cost challenge (i.e. percentage gap between efficient expenditure allowances and company business plan proposal) between our PR24 draft and final determinations, PR19 draft and final determinations, and Ofgem's most recent electricity distribution price control (RIIO-ED2). Our final determinations totex allowance after frontier shift efficiency and real price effects is 7 percent less than company proposals. This is smaller than the cost challenge applied by Ofgem at RIIO-ED2 draft determinations (-12%) and slightly larger than the cost challenge at PR19 final determinations (-5%).

Figure 2: comparison of cost challenges at recent price reviews

2. Base expenditure allowances

In this section we explain how we have set efficient base expenditure allowances. We also set out how we have provided water companies with sufficient base expenditure allowances to maintain and improve asset health. And how we have made sure that customers do not pay twice for outputs that should be delivered with base expenditure allowances (for example, water main replacements).

Base costs are routine, year-on-year costs, which companies incur in the normal running of the business to provide a base level of service to customers and maintain the long-term capability of assets. This covers both wholesale and retail activities.

There are three key elements to setting efficient base expenditure allowances, which are discussed in the subsections below, along with our consideration of stakeholder responses to our draft determinations:

- Base cost econometric benchmarking models
- Cost adjustment claims
- Unmodelled base cost assessment

Before the application of frontier shift efficiency and real price effects, efficient base expenditure allowances total £61.4 billion, which 4% below companies' proposals in draft determination representations of £64.1 billion.⁶

Our PR24 base expenditure allowances are 9% (£4.9 billion) higher than what we allowed at draft determinations. The most material drivers are:

- **Energy cost adjustment** – stakeholder responses noted the energy cost adjustment at draft determinations did not take into account the time lag between the DESNZ industrial energy price index and wholesale energy prices. We have adjusted this for final determinations, which increased the energy cost adjustment by around £1.4 billion. Differences between forecast and energy prices will be accounted for in the end-of-period energy price reconciliation mechanism.
- **Business rates** – in response to stakeholder responses, we have increased our independent view of business rates faced by water companies over the 2025–30 period by £1 billion. This incorporates a forecast of changes to business rates following the expected business rates revaluation in 2026 and 2029. Business rates are subject to 10:10 cost sharing rates. So, 90% of any underspend will be returned to customers, and 90% of any overspend will be recovered from customers.

⁶ Before the deduction of developer services revenue. Include price control and non-price control base costs. So, non-price control developer services and third-party services costs are included in this comparison.

- **Network reinforcement sector wide cost adjustment** – we are introducing a sector wide network reinforcement cost adjustment of around £0.7 billion at final determinations to support economic growth and new housing. This is in response to additional network reinforcement cost adjustment claims received in draft determination responses. We will claw back network reinforcement expenditure allowances if it is not used on network reinforcement through a price control deliverable.
- **Bioresources modelled base cost allowances** – we have allowed an additional £0.5 billion to fund investment at sludge treatment centres. For example, upgrades to advanced anaerobic digestion (AAD). This is the result of including historical sludge quality enhancement expenditure in the bioresources base cost models to address cost allocation differences between companies and over time in relation to AAD upgrades. This change ensures the models fund long-term bioresources growth.
- **Water mains renewal and phosphorus removal sector wide cost adjustments** – we have updated these sector wide cost adjustments to take into account stakeholder responses and new data, which increases allowances by around £0.3 billion.
- **Environment Agency water quality permit charges** – we assess these costs as part of unmodelled base costs for final determinations instead of modelled base costs. This change in approach follows the outcome of the Environment Agency's January 2024 consultation, which will increase water quality permit costs for wastewater companies. This change in approach increases allowances by around £0.2 billion.

After the application of frontier shift efficiency and real price effects, efficient base expenditure allowances total £60.1 billion, which are 19% higher than our base expenditure allowances in PR19 final determinations (£50.5 billion), and 7% more than what companies have spent in the past 5 years (£56.4 billion).⁷ We expect companies to deliver more for customers and the environment with the higher base allowances including:

- replace more water mains to improve asset health;
- replace more water meters to help facilitate the smart meter programme;
- increase network capacity to facilitate new housing growth;
- meet more stringent phosphorus permit levels when treating sewage; and
- improve service performance.

The higher base allowance also reflects higher input price pressures faced by companies in recent years and includes expenditure to serve a larger population.

We expect companies to continue to maintain and improve the long-term capability of assets and to meet existing permit and statutory obligations with base expenditure allowances.

⁷ PR19 base expenditure allowances have been adjusted to reflect the changes in the scope of base costs between PR19 and PR24.

We provide more details on base expenditure allowances for final determinations in section 5.

2.1 Base cost econometric benchmarking models

Our base cost econometric benchmarking models are the starting point of our base cost assessment and allow us to compare costs between companies on a like-for-like basis by taking into account multiple factors that drive differences in efficient base costs between companies and over time. For example, company size, treatment complexity, network topography. They help to overcome information asymmetry between Ofwat and water companies, and challenge companies to be efficient.

This element of our approach has three sub-components:

- econometric historical cost benchmarking models;
- forecasts of the explanatory variables; and
- a catch-up efficiency challenge, which encourages lagging companies to catch-up with the leading companies in the sector.

2.1.1 Econometric historical cost benchmarking models

We use a long time series of historical data from water companies, going back to 2011–12 for wholesale water, wastewater network plus and bioresources, and 2013–14 for residential retail. This allows us to capture the cyclical nature of capital maintenance expenditure and to take advantage of panel data analytical techniques. We use random effects to estimate the base cost econometric models, which we used at PR19, and the Competition and Markets Authority (CMA) used in the PR19 redeterminations.

The scope of modelled base costs for final determinations includes operating expenditure (opex), capital maintenance expenditure, and some enhancement. This is summarised in the table below. For final determinations, we have:

- **Added historical sludge quality enhancement expenditure into the scope of bioresources modelled base costs.** This mitigates for inconsistencies in reporting of expenditure related to advanced anaerobic digestion (AAD) upgrades at sludge treatment centres between companies, and helps to ensure the bioresources models provide an allowance for future growth. This addresses comments made by Anglian Water, Southern Water, South West Water and Wessex Water in draft determination representations that our bioresources base cost models at draft determinations did not provide sufficient allowances to fund new capacity or upgrades to AAD.
- **Removed Environment Agency water quality permit costs from the scope of wastewater network plus and bioresources base cost models.** We assess these costs separately due

to the step-change in costs expected in the 2025–30 period. Most wastewater companies suggested this in draft determination representations.

Table 3: scope of modelled base costs for final determinations

Cost area	Modelled base cost definition
Wholesale water	Operating expenditure (opex) Capital maintenance expenditure Network reinforcement expenditure Addressing low pressure enhancement expenditure
Wastewater network plus	Opex Capital maintenance expenditure Network reinforcement expenditure Reducing risk of sewer flooding enhancement expenditure Transferred private sewers and pumping stations enhancement expenditure Enhancement opex for a subset of enhancement lines where we have reasonable certainty the costs are ongoing (nitrogen removal, phosphorus removal; reduction of sanitary parameters; ultraviolet (UV) disinfection; chemical removal schemes)
Bioresources modelled base costs	• Operating expenditure • Capital maintenance expenditure • Bioresources growth enhancement expenditure • Bioresources quality enhancement expenditure
Residential retail	Doubtful debt Debt management costs Other retail costs (including customer services, meter reading, depreciation)

We capture the key cost drivers in our econometric models:

- **For wholesale base costs:** scale, treatment complexity, network topography, population density, economies of scale at sewage treatment works, urban rainfall, and location of sewage treatment works relative to sludge treatment centres.
- **For residential retail costs:** scale, amount of revenue at risk, customer's propensity to default, type of customer and Covid-19.

We use random effects to estimate the base cost econometric models, which we used at PR19, and the Competition and Markets Authority (CMA) used in the PR19 redeterminations.

We have historically engaged with the sector on our model selection, first through the Cost Assessment Group following PR19⁸ and more recently through our April 2023 modelling consultation.⁹ Our selected models produce results that align with engineering and economic rationale. This is not by accident. Internal and external engineering experts played an integral role in model development so that the models have a clear engineering rationale and capture the key cost drivers that explain differences in efficient base expenditure

⁸ [PR24 cost assessment working group](#)

⁹ Ofwat, '[Econometric base cost models for PR24](#)', April 2023

between companies and over time. We also developed our models with input from Cambridge Economic Policy Associates (CEPA), a specialist regulatory economics consultancy, and our econometric academic advisor, Professor Andrew Smith.

Stakeholder responses to our draft determinations are generally supportive of our modelling approach. Some stakeholders have raised specific representations primarily focused on our selection of cost drivers, which we discuss in our base cost modelling decision appendix document. We do not consider any stakeholders provided compelling evidence to justify changing our base cost econometric models at final determinations.

2.1.2 Explanatory variable forecasts

Our view of efficient base expenditure allowances for the 2025-26 to 2029-30 period depends on our forecasts of the explanatory variables included in our econometric base cost models. Explanatory variable forecasts directly impact our efficient allowances by changing allowances to reflect future changes in scale, density and complexity of water and wastewater businesses.

Each company produced a forecast for most explanatory variables as part of their draft determinations representation. We form an independent view of them to protect customers from the risk that companies' forecasts are too high, affecting allowances and customer bills.

What we said in our draft determinations

In our draft determinations, we accepted companies' forecasts for most cost drivers, with the following exceptions:

- **Connected properties (water and wastewater) for Portsmouth Water, SES Water, Thames Water and South West Water** – we forecasted property growth by linearly extrapolating growth in connected properties based on the full historical sample.

We took this approach for Portsmouth Water, Thames Water and South West Water because their property forecasts were considerably higher than those implied by historical growth rates and ONS household projections. SES Water forecasted a decrease in the number of properties from 2022-23 levels, but we did not receive a resubmission to correct this error in time for our draft determinations.

- **Pumping station capacity per length of sewer (wastewater) for Southern Water** – we applied Northumbrian's growth rate in pumping capacity per sewer length to Southern's most recent outturn figure at the time (2022-23). This resulted in an annual growth rate of 0.5% per annum (Northumbrian Water's) instead of 1% per annum as per Southern Water's forecast.

We took this approach to avoid customers overpaying because Southern Water forecasted high growth in pumping capacity through historical extrapolation rather than the increase being supported by an investment plan.

We also set out our cost drivers forecasts for which we use third-party data: density cost drivers for wholesale water and wastewater network plus, urban MSOA rainfall for wastewater network plus and propensity to default, income deprivation scores and Covid-19 dummy variables for residential retail.

Stakeholders' representations

We received limited comments on our cost driver forecasting approach.

South West Water disagrees with our use of ONS properties projections instead of its own forecast. It expresses confidence in its forecast submission and points to the UK Government's commitment to significantly increase house building across England as a source of pressure for the properties forecast in its regions.

Whereas, Northumbrian Water states we should use our properties forecast instead of its own. This is because our forecast is currently closer to the actual growth it expects. It also suggests we use "theoretical" load for forecasting purposes. It states that because 2023-24 was a much wetter than average year, this results in less load being measured for treatment (due to higher-than-average use of storm overflows). Northumbrian Water reports measured load rather than 'theoretical load' and so using the year 2023-24 for deriving forecasts results in an underestimate of the likely loads it will have in 2025-30.

Southern Water states it found an error in the calculation used to forecast pumping capacity, and that it rectified it in their response to our draft determinations.

Severn Trent Water suggests an alternative method to forecast the average bill size variable in the retail models, in response to our concern that the retail base allowances were not sufficiently stretching. The company suggests applying a 75 percent weight to the forecast average bill size and 25 percent on the historical bill size, as a more stable proxy for risk.

Our assessment and reasons

We have revisited our approach to forecasting properties at final determinations following consideration of stakeholder responses. We recognise that future growth can be different to historical growth. But we still have concerns that some companies have overstated forecast growth in properties over the 2025-30 period, which would lead to customers overpaying. Portsmouth Water, Thames Water and South West Water in water, and Thames Water and South West Water in wastewater, have forecast growth in total properties served that exceeds the companies' forecast new properties in the developer services business plan tables. This does not provide us with confidence that these companies' property forecasts are sensible or

realistic. We therefore maintain our draft determination position of forecasting properties using linear extrapolation for these companies to protect customer interests.

We also forecast properties using linear extrapolation of historical growth for SES Water. This is because the company forecasts a decrease in properties in 2026-27 and 2028-29, which we do not consider is sensible. We encountered a similar issue at draft determinations.

We forecast sewage load for Northumbrian Water by applying its forecast growth in properties to its higher 2022-23 load figure. This addresses the unusually low load reported in 2023-24.

We queried South West Water after identifying a discrepancy between its 2023-24 annual performance report (APR) submission and its August 2024 representation on its 2023-24 figure for sewer length. South West Water confirmed it considers the higher sewer length figure reported as part of its August 2024 representation to be correct. It states the increase in sewer length is due to a change in approach to estimating sewer length, which it considers is more accurate, rather than because it has identified additional sewers. This change created a step-change in the historical sewer length data for South West Water, which impacted model estimation results. We consider it would be inappropriate to accept this data change at this late stage of the PR24 process, not least because we do not have the restated sewer length data for all other years in the sample (2011-12 to 2022-23). Particularly when the change would impact allowances for other companies. We therefore use South West Water's original APR submitted sewer length value for cost assessment purposes in addition to using Ofwat forecasts for South West Water over the 2025-30 period. We will revisit sewer length data at PR29.

We accept Southern Water's restatement of its pumping capacity forecast as it is more aligned with other companies forecast growth rate. But we expect the company to produce forecast of cost drivers based on its investment plans rather than through trend analysis in future price reviews.

We assessed the impact of placing some weight on historical average bill size when setting residential retail expenditure allowances in response to Severn Trent Water's suggestion. But we decided to maintain our draft determination position of using company forecast of average bill size to set residential retail allowances. This approach leads to an achievable cost efficiency challenge, and reflects the view shared by most draft determination respondents that our residential retail cost efficiency challenge at draft determinations provided a sufficiently stretching cost efficiency challenge given uncertainty around the impact of PR24 on bad debt. Some companies also increased requested residential retail costs in draft determination representations.

Our final determination

We mostly accept companies' cost driver forecasts included in draft determination representations, with a few exceptions:

- **Property forecasts** – we maintain our draft determination position of using linear extrapolation of historical growth to forecast properties over the 2025–30 period for Portsmouth Water, SES Water, Thames Water and South West Water.
- **Sewage load** – we maintain our draft determination position of forecasting load based on the forecast growth in properties, recognising that both variables should be closely correlated. For Northumbrian Water, we use load in 2022–23 as the starting point due to the company reporting unusually low load in 2023–24 because of high rainfall.
- **Sewer length** – we forecast sewer length for South West Water based on linear extrapolation due to the company restating 2023–24 sewer length data (discussed above), which we have not accepted for final determinations.
- **Cost drivers based on third-party data** (eg weighted average density) – companies did not include a forecast in business plans, so we have used our own forecast to set efficient base expenditure allowances. We received no stakeholder representations. Therefore, we have not made any changes to our approach in final determinations.

2.1.3 Catch-up efficiency challenge

In a competitive market, inefficient companies cannot charge a premium to customers to cover their inefficiency. As monopoly providers of an essential service, water companies do not face competitive market pressures in most services they provide. We must therefore set efficient base cost allowances to protect the interests of current and future customers.

A stretching but achievable cost efficiency challenge encourages lagging companies to catch-up with the leading companies in the sector (ie **catch-up efficiency**) and encourages leading companies to improve further (ie **frontier shift efficiency**). We focus on catch-up efficiency here. Frontier shift efficiency is discussed in section 4.

The catch-up efficiency challenge applied depends on the benchmark (ie median, upper quartile, or leading company) and the time period used to set the catch-up efficiency benchmark. We discuss each of these decision points below.

Base cost catch-up efficiency benchmark

We use our econometric base cost benchmarking models to identify the relatively efficient companies within the sector. We use this information to set a catch-up efficiency challenge to the less efficient companies in the sector.

No cost model is perfect. So, the difference between modelled predicted costs and actual costs cannot be explained fully by efficiency/inefficiency. We mitigate this in three ways:

- triangulate across a suite of base cost models with different cost drivers and at different levels of cost aggregation;
- allow companies to submit cost adjustment claims if they consider there is an important cost driver omitted from the base cost models; and
- set the catch-up efficiency benchmark away from the most efficient company.

We set the base cost catch-up efficiency benchmark at the upper quartile for PR24 final determinations. This is consistent with wider regulatory practice, including the catch-up efficiency benchmark applied by the Competition and Markets Authority (CMA) in the PR19 redeterminations. All water companies applied at least an upper quartile benchmark to develop their base cost proposed included in PR24 business plans.

We applied the same benchmark at draft determinations, and it is generally supported by stakeholders. The exception was Thames Water, which considers the bioresources catch-up efficiency challenge should be less stretching and set on a glide path to the upper quartile benchmark because it is the first price review where bioresources base expenditure allowances have been set independently from wastewater network plus. It also considers the bioresources base cost models perform relatively weakly. We disagree with Thames Water's views. We conducted significant work ahead of PR24 to improve cost allocation between sewage treatment and bioresources, which has allowed us set separate bioresources and wastewater network efficiency challenges at PR24. This has improved the robustness of our bioresources base cost models compared to PR19, and we see no reason to set the benchmark less stretching than the upper quartile company.

At draft determinations, we expressed concern that an upper quartile benchmark may not be sufficiently stretching. We noted that our PR24 base cost econometric models can more precisely set efficient base expenditure allowances than at PR19, and that an upper quartile benchmark is less stretching than the 85th percentile benchmark applied by Ofgem in the latest electricity and gas distribution price controls (RIIO-ED2 and RIIO-GD2).¹⁰ No stakeholders supported applying a more stretching catch-up efficiency challenge in draft determination responses. Therefore, we maintain our draft determination approach to use the upper quartile benchmark at final determinations, which is in line with the benchmark selected by the CMA in the PR19 redeterminations. This is an achievable catch-up efficiency challenge (eg it only reduces wholesale water model predicted costs by 1.3 percent), but will still be stretching for some companies.

Time period used to set the catch-up efficiency benchmark

At draft determinations we set the catch-up efficiency challenge for base costs using the last five-years of outturn data (2018-23). We received no representations on this issue.

¹⁰ Ofgem applied a glidepath from the upper quartile to the 85th percentile.

For final determinations, we retain our draft determination approach and set the catch-up efficiency challenge using the last five-years of outturn data for water, wastewater network plus, and residential retail base costs (2019-24).¹¹ This ensures the catch-up efficiency challenge is not based on a single atypical year by any one company, while also putting more weight on more recent data to reflect the recent efficiency levels and cost pressures faced by the sector. This is consistent with our approach at PR19 and the approach taken by other regulators including the CMA in the PR19 redeterminations.

This approach leads to a smaller catch-up efficiency challenge than if we had used the full-sample (2011-24). This is due to higher outturn costs in recent years caused by factors not explained by the cost drivers (eg relatively high input prices). This helps to reflect relatively high input prices faced by water companies in recent years in allowances. There is some risk that the catch-up efficiency challenge overlaps with the energy cost adjustment (discussed below). But we consider calculating the catch-up efficiency challenge over the full sample-period would overcompensate the overlap. It would address the energy cost overlap but also mean that base expenditure allowances do not reflect other cost pressures incurred by water companies in recent years (eg higher labour costs). Calculating the catch-up efficiency challenge over the last five-years therefore provides companies with headroom to deliver performance improvements with base expenditure allowances over the 2025-30 period.

For bioresources, we set the catch-up efficiency benchmark using the full historical sample (2011-24) for final determinations. This change in approach follows the decision to include historical sludge quality enhancement in the bioresources base cost models. This helps to provide a sufficient allowance for long-term bioresources growth, including upgrades to advanced anaerobic digestion (AAD). Investment at sludge treatment centres to facilitate growth tends to be more lumpy than other expenditure. The calculation of the catch-up efficiency challenge over the full-sample helps to take this into account. It leads to a less stretching bioresources catch-up efficiency challenge than if we had continued to use the last five-years of outturn data.

2.2 Cost adjustment claims

Econometric cost modelling is the main benchmarking tool we use to set an efficient cost allowance for each company. We recognise that our statistical models cannot account for all relevant factors that affect costs. There may be instances where an adjustment is required to account for these factors.

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.

¹¹ This has been updated at final determinations to include the last year of outturn information (2023-24).

We expect companies to submit compelling evidence against the assessment criteria set out in our PR24 methodology to demonstrate the need for a cost adjustment.¹² Setting a high evidential bar is important as companies are likely to only submit cost adjustment claims that will increase its cost allowance. The CMA made the same point in its PR19 redeterminations.¹³

Cost adjustment claim assessment criteria

In our PR24 methodology, we set out the assessment criteria we would use to assess cost adjustment claims,¹⁴ with the two key criteria being:

- **Need for adjustment** – we expected companies to provide compelling evidence to demonstrate why our econometric models do not adequately capture their unique circumstances. We also expected companies to demonstrate that the base cost allowance would be insufficient to accommodate these unique circumstances without the claim. If an alternative explanatory variable is used to calculate the cost adjustment, we expected the company to explain why it is superior to the explanatory variables in the base cost models. The claim would be rejected if it fails the 'need for adjustment' criterion.
- **Cost efficiency** – we expected companies to provide compelling evidence that the cost estimates are efficient, and clearly explain how it arrived at the cost estimate.

We described the evidence we expected companies to provide to justify a step change in efficient capital maintenance expenditure through the cost adjustment claim process. It is important we provide sufficient funding for companies to maintain good asset health. But we must also make sure that customers do not pay twice for capital maintenance or pay for inefficiency. We expected companies to:

- provide evidence of a clear link between the exogenous factors and capital maintenance expenditure requirements; and
- provide evidence of how these exogenous factors are likely to change in the future;
- demonstrate good practice in asset maintenance; and
- demonstrate efficient use of base expenditure allowances in previous periods. We stressed that cost adjustment claims should not be used to make up for previous underinvestment or under delivery in maintenance.

We expected companies to demonstrate that each cost adjustment claim is material using the thresholds presented in our PR24 methodology.¹⁵ Materiality thresholds help to:

- mitigate the risks posed by asymmetry of information; and

¹² Ofwat, '[PR24 final methodology: Appendix 9 setting expenditure allowances](#)', pp.28.

¹³ Competition and Markets Authority, 'Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations. Final report.', paragraph 4.949.

¹⁴ Ofwat, '[PR24 final methodology: Appendix 9 setting expenditure allowances](#)', pp.31.

¹⁵ Ofwat, '[PR24 final methodology: Appendix 9 setting expenditure allowances](#)', A1.2 Cost adjustment claim assessment criteria, pp.156-159.

- proportionately focus our assessment on the most significant cost adjustments.

We expected companies to submit symmetrical cost adjustment claims where the claim relates to costs incurred historically and subsequently included in our modelled base cost allowance. This was to protect customers from the risk of a one-sided process. For example, we expected companies to explain how an upward adjustment to its modelled base cost allowance would impact on cost allowances for other companies. But a cost adjustment claim did not need to be symmetrical if it was driven by a sector-wide step-change in base expenditure requirements.

Summary of cost adjustment claims received

We received 64 cost adjustments in PR24 business plans, totalling £5.4 billion.

For draft determinations, we identified common themes in cost adjustment claims, which led us to apply five sector wide cost adjustments to reflect that historical costs are not always a good reflection of the future: energy costs, mains renewals, meter renewals, phosphorus removal, and net zero. We accepted or partially accepted 28 claims, rejected 28 claims, and reallocated eight claims to enhancement for separate assessment. Base cost adjustments totalled £1.5 billion at draft determinations.

For final determinations, we extend our sector wide cost adjustments to also include a network reinforcement sector wide cost adjustment following additional cost adjustment claims received in draft determination representations. We therefore apply six sector wide cost adjustments to reflect that historical costs are not always a good reflection of the future: energy costs, mains renewals, meter renewals, phosphorus removal, net zero, and network reinforcement. Base cost adjustments total £3.9 billion at final determinations, which includes updates to our sector wide cost adjustments, in particular energy.

Water UK recently outlined on behalf of water companies three potential implications of the UK October 2024 budget announcement on the PR24 determinations:

- Water UK estimates that water companies will face £382 million in additional costs caused by the increase in employers' national insurance contributions and reduction in the liability threshold, which will take effect from 6th April 2025.
- Water UK estimates that water companies face more than tens of millions of pounds in additional business rates in England, which are likely to take effect from April 2026.
- Water UK estimates that water companies will face at least £200 million in additional bad debt costs from the impact of the reduction to the repayment cap for Universal Credit.

Companies have not provided compelling evidence to demonstrate the need for adjustment for any of these three issues.

Firstly, on employers' national insurance (NI) contributions, the overall impact on customer costs is uncertain, as reflected by the fact that Water UK's proposed cost adjustment reduced from its initial estimate of £500 million to its updated estimate of £382 million. The reported impact varies significantly across companies, with the reported impacts for some companies more than double other companies after taking into account company size. It would therefore be difficult to include an accurate cost adjustment in base expenditure allowances, and the cost adjustment would be immaterial relative to base expenditure allowances. The impact of the change in tax is unclear. If the cost is passed on by other employers in terms of higher prices in the general economy then water companies will receive an increase in allowances as revenues are indexed to inflation. If the impact is on wages then this could depress wage growth going forwards. Cost sharing is sufficient to address this uncertainty, with companies able to recover 50% of any overspend on base costs from companies.¹⁶ There may also be other unexpected events that lead to water companies incurring lower base costs than forecast in business plan, that cancels out any cost increase caused by increases in employers' NI contributions.

Secondly, we have updated our business rates expenditure allowances at final determinations to reflect the likely impact of 2026 and 2029 revaluations on business rates. Please see section 2.3.1 for more details. So, further cost adjustments are not required.

Thirdly, the analysis underlying the Water UK's estimated impact of Universal Credit on bad debt costs is not credible, and any potential cost impact is likely to be immaterial and uncertain. Retail expenditure allowances at final determinations are sufficient to account for any increases in bad debt costs caused by the UK Budget announcement.

- Water UK claims that 190,000 households were subject third-party deductions via Universal Credit in 2023–24, equivalent to around £100 million revenue. This works out at £526 per household, which seems very high relative to the average water bill.
- Water UK also seem to assume that water companies can recover all the water bill through third party provision, which would be surprising given water companies are 6th in line behind other service providers (housing, accommodation, hostel, rent and service charges, gas and electricity).
- Retail allowances are 3% higher than outturn costs over the past five-years, which includes companies' high debt provisions across the affected Covid years. And our retail allowances are only 1.7% below companies' requested costs, which already incorporate an increase in bad debt costs because of increasing water bills.

In the subsections below, we explain our approach to determining the six sector wide cost adjustments, and demonstrate how we have considered stakeholder responses. We note that South West Water stated in its draft determination representation that it opted to forego the sector wide cost adjustments and associated price control deliverables as it considers its

¹⁶ Except Thames Water.

proposed allowances are sufficient to carry out its business plan proposals. We disagree. It is important that the sector moves towards a more sustainable mains renewal rate and improves asset condition; replaces meters to facilitate timely and efficient delivery of smart metering programmes; invests in supporting infrastructure to reduce emissions from the use of vehicles and heating; and delivers additional network capacity to facilitate growth. The sector wide cost adjustments and associated price control deliverables will help to facilitate this.

We provide detail on our assessment of cost adjustment claims in individual company cost adjustment claim excel models that are published as part of our final determinations.

2.2.1 Delivering a step-change in water mains replacement to maintain and improve good asset health

What we said in our draft determinations

The aim of the cost adjustment was to move the sector towards a more sustainable mains renewal rate and to improve asset health over the 2025-30 period. In our PR24 methodology, we expressed concern that despite PR19 business plans including a mains renewal rate of 0.4% a year, current water mains renewal rates (0.1% a year on average across the sector) are un-sustainably low and that companies are not undertaking enough renewals to keep up with deterioration. Our draft determinations aimed to increase the sector average mains renewal rate to 0.46% a year over the 2025-30 period, which we proposed to hold all companies to account for through a price control deliverable.¹⁷

To achieve this, at draft determinations we set an expectation of 'what base buys' of 0.3% a year. This was based on the historical average renewal rate over the 2011-12 to 2022-23 period used to estimate the base cost models. This means that each company will deliver a mains renewal rate of at least 0.3% a year over the 2025-30 period with base expenditure allowances.

We expected eight companies with below average asset health to deliver renewals at a higher rate to reduce the proportion of condition grade 4 (poor) and 5 (very poor) mains.¹⁸ Our analysis of water mains asset condition data revealed that 4.4% of the total network length is in condition grade 4 and 5, judging from burst rates. Although this is a decrease from 6.3% in PR09, we consider that the asset condition of water mains should improve further so that assets are more resilient to the impacts from climate change. For these eight companies, we

¹⁷ Including renewals delivered through enhancement leakage and water quality allowances.

¹⁸ South West Water (Bristol region), Dŵr Cymru, Northumbrian Water, South East Water, Southern Water, Thames Water, Wessex Water, Yorkshire Water.

proposed a cost adjustment to target these mains and set the expectation that they would need to deliver renewals at a minimum rate of 0.43% a year over the 2025–30 period.¹⁹

So that customers do not pay twice for mains renewals, we proposed to hold five companies to a higher base renewal rate.²⁰ These companies all demonstrated a deterioration in asset condition between PR09 and PR24. The companies were only eligible for a further cost adjustment to improve asset health if their adjusted base rate was below 0.43% a year.

Based on the median unit cost of £292 per metre, we applied a total adjustment of £297 million to base expenditure allowances.²¹

Stakeholders' representations

What base buys

Eleven out of 16 water companies disagreed with our draft determination view of what base buys (0.3% a year). Most of these companies focused their feedback on our approach to calculating the renewal rate, and did not agree with our draft determination approach of using the full historical period (2011–12 to 2022–23). The representations offered a range of alternative approaches to calculating the rate, which we discuss in the section below.

More general comments related to the following:

- Some water companies stated that the totex and outcomes framework incentivises investment to meet performance commitment levels rather than investing to improve long term asset health. This can divert investment away from low impact assets, such as water mains.
- Some water companies expressed disagreement with setting the expectation that base allowances fund a certain renewal rate for each asset class. And that this level is the same for all companies.
- Some companies considered that we did not provide sufficient evidence that 0.3% (or higher) is an efficient level of replacement during 2025–30.
- Some water companies stated that the approach does not account for the replacement of different types of mains.

¹⁹ This is an average mains renewal rate. Some companies will have to do more than others to improve asset health.

²⁰ South West Water (Bristol region), Dŵr Cymru, Southern Water, Wessex Water, Yorkshire Water.

²¹ Pre-frontier shift and RPEs.

Holding companies to account

We held five water companies to account for asset deterioration between PR09 and PR24 by expecting them to deliver more mains renewals through base expenditure allowances.²² All five companies disagreed with our proposal for the following reasons:

- The companies disagreed that a deterioration in asset condition indicates that there has been insufficient investment to maintain the assets since PR09.
- Dŵr Cymru, Southern Water and Yorkshire Water stated that condition grade is only one asset health metric that informs company investment decisions. Companies argue that burst rates and performance against performance commitment levels (PCLs) would indicate that asset health has improved over time, not deteriorated.
- Dŵr Cymru, Southern Water, Wessex Water and Yorkshire Water stated that base allowances have been spent flexibly and companies have invested where required. In some cases, this has constrained mains renewals rates, but has not impacted service levels delivered to customers.
- Dŵr Cymru and Wessex Water raised concerns with the comparability of PR09 data, and consideration of their high historical renewal rates (alongside South West Water).

The Consumer Council for Water (CCW) agreed an increase in mains renewals is needed. But raised concerns that this may lead to customers questioning why they need to pay for a step up in mains renewals. Particularly when companies did not achieve the PR19 mains renewal expectation.

Unit cost

Eleven water companies supported our proposal to apply the median unit cost across the sector. Most of these companies also provided evidence of unit costs that were either in line with, or below, our draft determination unit cost.

Five water companies stated that our proposed unit cost was too low.²³ And expressed concern that this could incentivise companies to replace pipes based on low cost rather than those delivering most benefit. These companies encouraged us to apply a higher rate in our final determination.

The Yorkshire Forum for Water Customers expressed concerns that our proposed adjustment may not sufficiently fund Yorkshire Water to deliver the required mains renewals to deliver asset health benefits.

²² South West Water (Bristol region), Dŵr Cymru, Southern Water, Wessex Water and Yorkshire Water.

²³ Dŵr Cymru, Southern Water, Thames Water, Yorkshire Water and South East Water.

Deliverability

Thames Water agreed that it should challenge itself to deliver more renewals during the 2025–30 period. But it stated that our draft determination proposal is undeliverable due to supply chain constraints and third party restrictions. The company asked us to consider a renewal rate of 0.34% over the 2025–30 period as part of our final determination. It stated that this approach will allow it to ramp up to deliver 1,000km of mains replacements across the 2030–35 period.

Our assessment and reasons

We retain the sector wide adjustment for mains renewals at final determination. However, we have amended our approach having considered stakeholders' feedback and additional outturn data.

What base buys

We retain our draft determination view that base buys mains renewals at a rate of 0.3% a year. This is derived from the average renewal rate delivered through base allowances across the historical period.²⁴ We expect all companies to deliver renewals at this rate as a minimum across the 2025–30 period.²⁵

We have considered the arguments for moving to an alternative approach to calculating what base buys: including using the last 5 years of data only, removing AMP5 years and looking at upper quartile companies. However, we do not think there is a clear rationale for moving to a different approach. Our base models determine allowances based on the full historical period and in doing so, provide long term allowances that enable companies to maintain the long-term capability of assets while managing peaks and troughs in capital maintenance over time. We applied the same approach to determining what base buys at PR19 for sector wide growth unit cost adjustment, which the Competition and Markets Authority also used. We therefore do not consider it appropriate to select a subset of years to determine what companies are funded to deliver over the long term.

In addition, eight companies forecast they would deliver mains renewals at a rate of 0.3% a year or above in response to our draft determinations.²⁶ Despite disagreeing with our proposal, the remaining eight companies did not share a common view of what base buys.

²⁴ We chose not to include 2023–24 outturn data based on a further deterioration in renewal rates, with over half of the sector delivering at a rate that is at or below 0.1%. We do not consider this reflective of what base allowances deliver, and have therefore excluded this year from our calculation.

²⁵ Some companies are expected to deliver at a higher rate due to asset deterioration and/or our sector wide adjustment.

²⁶ Hafren Dyfrdwy, SES Water, Severn Trent Water, South Staffs Water, Affinity Water, Bristol Water (0.28%), Portsmouth Water and Dŵr Cymru.

Northumbrian Water, United Utilities and Wessex Water stated that they did not consider there to be sufficient evidence on why 0.3% (or higher) is an efficient rate of renewals over the 2025–30 period. In our draft determinations, we raised concerns that if the sector continues to undertake mains renewals at its current renewal rate, it would take over 700 years to replace its entire network.²⁷ This is compared to the expected asset life of around 160 years. Increasing each company's mains renewal rate to at least 0.3% over the 2025–30 period will ensure that the sector moves towards a more sustainable mains renewal rate. We encourage the sector to use the 2025–30 period to determine what this sustainable rate of mains renewals is, and to work towards delivering that in the future.

Holding companies to account

We continue to hold companies to account for historical delivery of capital maintenance so that customers do not pay twice. Companies have a duty to maintain an efficient and economical system of water supply, including maintaining good asset health. In accepting their final determinations, companies accept that they have sufficient funds to undertake their functions and meet their statutory obligations.

We have updated our approach to implement a 'twin test' which considers both asset condition deterioration between PR09 and PR24 and historical renewal rates. Under this approach, we do not hold the company to account for a higher base mains renewal rate if a company has allowed asset condition to deteriorate but has renewed its mains at a higher rate than the sector average.

Considering the two elements in tandem allows for a fuller picture on how companies have been investing in and maintaining their assets. Implementing this twin test addresses some of the concerns raised by Bristol Water and Wessex Water relating to high historical renewal rates and stable asset performance. It ensures that companies that have been undertaking renewals at a higher rate in the past are not penalised. These companies help to increase our 'what base buys' renewal rate which benefits customers in the long-term. We do not want to disincentivise companies from continuing to deliver more through base expenditure allowances in the future.

We agree with CCW's point that customers could be concerned about paying twice for mains renewals. Our approach helps to prevent customers from paying twice by requiring companies that have allowed asset condition to deteriorate since PR09, and delivered less mains renewal than other companies, to deliver more mains renewal from base expenditure allowances before we provide additional expenditure allowances.

At final determinations we are holding Dŵr Cymru, Southern Water and Yorkshire Water to account for a deterioration in asset condition and relatively low mains renewal rates over the

²⁷ UK Water Industry Research, '[Long-term aging of polyethylene pipes](#)', September 2020.

historical period.²⁸ We have removed the adjustment from South West Water and Wessex Water as they have delivered a higher than average mains renewal rate.

Unit cost

Our final determination assessment is based on a unit cost of £300 per metre. This is the median unit cost based on a wider range of unit cost data provided in response to our draft determinations. This includes outturn unit costs that were reported by some companies.

For Thames Water, we have allowed the company a unit cost of £1,180 per metre for renewals carried out in its London operating area. Thames Water has not provided compelling evidence to justify the higher unit cost requested in its PR24 business plan. But we acknowledge the additional cost pressures faced when operating in central London. Our allowed unit cost is the average unit cost for mains renewals due to bursts reported in the Thames Water London Conditional Allowance. For renewals carried out in Thames Valley, we do not consider there to be a case for a higher unit cost and apply the standard rate (£300 per metre). This ensures fair and consistent treatment between companies operating in similar locations.

Deliverability

We accept Thames Water's proposal to deliver 553km of mains renewals over the 2025–30 period. We have engaged with company through the PR24 query process, and it committed to increase its delivery capabilities to deliver 1,000km of mains renewals in the 2030–35 period and engage with local authorities and Transport for London to facilitate the work.

Additional adjustments

We have adjusted Anglian Water, Dŵr Cymru and Wessex Water's base expenditure allowances in our final determination. We accept Anglian Water's mains renewal cost adjustment claim in full. We apply an adjustment to Dŵr Cymru's allowance based on its enhancement water quality case for asbestos cement mains renewals. We apply the asset health uplift to Wessex Water's allowance because it has below average asset health and we have removed its under delivery base adjustment. A detailed write up of our assessments is included in our supporting excel model.

²⁸ Dŵr Cymru restated its PR09 asset condition data in its DD representations. We accept this restatement and reflect it in our analysis.

Economic Insight report for Water UK on asset maintenance and replacement ²⁹

Water UK recently claimed that asset replacement rates are around a tenth of those in Europe. This was based on analysis included in a 2022 Economic Insight report.³⁰ This statement is misleading.

Firstly, Economic Insight's focus was almost solely on water mains. We recognise that current mains renewal rates are not sustainable, which we are addressing through the sector wide mains renewal adjustment.

Secondly, Water UK's comparison with European replacement rates is misleading. The cited figures compare mains renewal rates in England and Wales with aggregated rates for all drinking water assets in Europe, making such comparisons inappropriate. Our proposed mains renewal rate of 0.45% is a significant step forward, designed to address long-term sustainability while recognising that over 40% of water mains in England and Wales are less than 30 years old.³¹ The average mains renewal rate between 1990–91 and 2023–24 is 0.8% per year, which implies an asset life of 125 years. We expect the sustainable mains renewal rate to be between 0.6% and 0.8% a year in the long term, which assumes an asset life of between 125 and 160 years for modern plastic pipes.

Our final determination

Mains renewals delivered through base allowances in 2023–24 dropped to an average of 0.1% across the sector. This is the lowest mains renewal rate across the historical modelling period. It is also significantly below the 0.4% a year average renewal rate forecast in PR19 business plans. The historical average renewal rate of mains renewals is 0.3% a year across the 2011–12 to 2023–24 period. Over the PR19 period, this has dropped to just 0.14% a year on average.

This deterioration reinforces the need for the sector to increase mains renewals in the 2025–30 period and move towards a more sustainable renewal rate. We expect companies to determine this rate using robust asset deterioration modelling. We expect this to be between 0.6% and 0.8% a year in the long term, which assumes an asset life of between 125 and 160 years for modern plastic pipes.

Our proposed renewal rate at PR24 is a significant step forward, designed to address long-term sustainability while recognising that over 40% of water mains in England and Wales are less than 30 years old. Our approach reflects our commitment to addressing immediate risks,

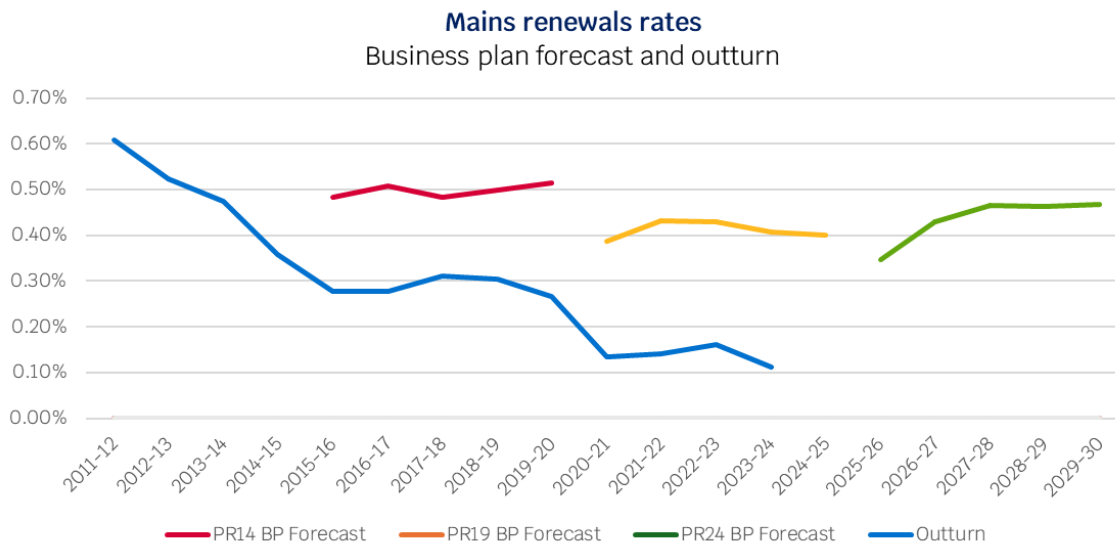
²⁹ Economic Insight, '[Options for a Sustainable Approach to Asset Maintenance and Replacement](#)', June 2022.

³⁰ Economic Insight, '[Options for a Sustainable Approach to Asset Maintenance and Replacement](#)', June 2022.

³¹ PR24 draft determinations, July 2024, [Expenditure Allowances](#), Section 2.2.1.

such as bursts, while encouraging companies to identify and prioritise further resilience measures during the 2025–30 period.

Figure 3: Mains renewal rates over time



During the 2025–30 period, we expect the sector to deliver mains renewals at a minimum rate of 0.3% a year. This is consistent with our view of what base buys. For some companies, this renewal rate is higher due to our approach to holding companies to account for asset deterioration and applying our sector wide adjustment. We set out company specific renewal rates required through base expenditure allowances during the 2025–30 period in the table below.

At final determination we have applied a total adjustment of £456 million to wholesale water base expenditure allowances. This applies to nine companies, all of which we consider to have below average asset condition.³² These companies are expected to deliver renewals at a minimum of 0.43% across the 2025–30 period.³³ And we expect these additional allowances to be used to target improving asset health over the 2025–30 period by targeting condition grade 4 and 5 mains cohorts.

With base and enhancement allowances, the sector is set to deliver mains renewals at an average annual rate of 0.45% over the 2025–30 period.³⁴ This equates to approximately 8,500km of mains renewals in total across the sector. The expected renewal rates for each

³² Anglian Water, Dŵr Cymru, Northumbrian Water, Southern Water, Thames Water, Wessex Water, Yorkshire Water, South West Water (Bristol region) and South East Water.

³³ Anglian Water and Yorkshire Water are expected to deliver renewals at a rate that is in line with their accepted cost adjustment claims (0.54% and 0.66% respectively).

³⁴ This is a small decrease in our draft determination rate due to our position on holding companies to account and enhancement allowances for mains renewals.

company are included in the table below under 'Total required mains renewal rate (% a year)'.

All companies will be held to account for delivery of mains renewals through a company specific price control deliverable. This will be consistent with the renewal rates in the table below. We discuss this in our Price Control Deliverables appendix.

Table 4: Mains renewals cost adjustment

Company	Required base renewal rate (% a year)	Asset health additional renewal rate (% a year)	Enhancement Leakage and/or Water quality renewal rate (% a year)	Total required mains renewal rate (% a year)	Adjustment to base allowances through mains renewals cost adjustment (£ million, 22-23 prices)
Anglian Water	0.30%	0.24%	0.02%	0.56%	144.4
Dŵr Cymru ³⁵	0.33%	0.03%	0.07%	0.43%	9.6
Hafren Dyfrdwy	0.39%			0.39%	
Northumbrian Water	0.30%	0.13%	0.004%	0.43%	51.3
Severn Trent Water	0.38%		0.19%	0.57%	
South West Water	0.30%			0.3%	
Southern Water	0.40%	0.03%	0.07%	0.50%	6.2
Thames Water	0.30%	0.04%		0.34%	72.0
United Utilities	0.30%		0.12%	0.42%	
Wessex Water	0.30%	0.13%		0.43%	23.3
Yorkshire Water	0.45%	0.21%		0.66%	106.4
Affinity Water	0.30%			0.30%	
Bristol Water	0.30%	0.13%	0.16%	0.59%	13.4
Portsmouth Water	0.30%			0.30%	
South East Water	0.30%	0.13%	0.07%	0.50%	29.5
South Staffs Water	0.56%			0.56%	
SES Water	0.30%			0.30%	
Sector total	0.34%			0.45%	456.1

2.2.2 Delivering a step change in meter replacements to facilitate delivery of the smart meter programme

What we said in our draft determinations

³⁵ In document WSH-DD-06, Dŵr Cymru assumes that base buys 0.30%, and uses this rate in its analysis. But the company responded to a query stating its original business plan view 0.02%. We do not consider this rate an appropriate reflection of what base allowances buy and have therefore reflected what is reported in the company's draft determination representations.

We applied a sector wide meter replacement cost adjustment of £749 million at draft determinations to fund the additional meter replacement costs companies will face from their enhancement smart metering programmes. The adjustment was proposed to encourage timely and efficient delivery of the smart metering programme and provide additional allowances for forecast meter replacements above our view of what base buys.

Our draft determination adjustment was based on company forecast meter replacements across the 2025-30 period, and any additional replacements being delivered through the accelerated process during 2023-24 and 2024-25. We proposed holding companies to account for delivery of PR19 meter replacements so that customers do not pay twice. We assumed an implicit allowance based on the average meter penetration and replacement rate across the 2011-12 to 2022-23 period.

Stakeholders' representations

The sector broadly supported our proposal for the sector wide meter replacement cost adjustment in draft determinations representations.

South East Water, Yorkshire Water and Northumbrian Water stated that what base buys should be based on the last 5 years of data only. The companies stated that this approach is consistent with how we set our base catch-up efficiency challenge.

Portsmouth Water, South East Water and Wessex Water all disagreed with our proposal to hold companies to account for PR19 under-delivery. The companies stated that the sector was not funded to deliver a specific level of activity at PR19 and that base allowances are invested flexibly. All three companies ask us to remove this adjustment at final determinations.

Water companies broadly supported our proposal to apply the median unit cost to all companies, and did not support moving to a more stretching benchmark. For some companies, this preference was driven by concerns over the robustness of our enhancement metering model used to derive the unit rate. Others stated that the median rate would allow them to undertake a more complex mix of work.

Our assessment and reasons

Having considered stakeholder responses, we retain the sector wide adjustment for meter replacements at final determinations, and have not made any material changes to our approach.

What base buys

We calculate what base buys using the full historical period (2011-12 to 2023-24). This is in line with our approach in other sector wide adjustments. We disagree with the proposal to

calculate what base buys using the last 5 years of data only. Companies argue that our approach should align with how we set the base catch-up efficiency challenge, but we do not consider there to be a clear rationale for doing so. Base allowances are set based on the full historical period to provide long-term allowances for companies to maintain the long-term capability of assets while managing peaks and troughs in capital maintenance over time. We applied the same approach to determining what base buys at PR19 for sector wide growth unit cost adjustment, which was also used by the Competition and Markets Authority at PR19. Water companies also welcomed consistency in our approach to determining what base buys between our sector wide adjustments in response to our draft determinations.

Holding companies to account

We retain our draft determination approach to holding companies to account for PR19 meter replacements delivery so that customers do not pay twice for meter replacements.

We have updated our analysis to reflect the latest year of outturn replacements (2023-24) and updated business plan data table forecast replacements for 2024-25. We are also holding companies to account for forecast meter replacements in 2024-25 through the metering price control deliverable (see Price Control Deliverables Appendix for more detail).

Unit cost

We retain our draft determination approach to calculating the median unit cost of meter replacements via the enhancement metering assessment. This was widely supported in draft determination representations.

Our unit cost for final determinations is around £124 per meter replacement (pre-frontier shift efficiency and real price effects). This is a small decrease in the unit cost applied at draft determinations (around £129 per meter) resulting from updates to the enhancement metering model and company input data.

Our final determination

As part of our PR24 final determination, we apply a total adjustment of £729 million to the wholesale water base expenditure allowances. This will enable the sector to deliver a total of 7.8 million meter replacements across the 2025-30 period to facilitate the timely delivery of the enhancement smart metering programme. Companies will be held to account for delivery of all forecast meter replacements through a price control deliverable.

Table 5: Meter replacement cost adjustment

Company	Total forecast replacements ³⁶ (number)	Implicit allowance: funded replacements (number)	Additional renewals funded through adjustment (number)	Adjustment to allowances ³⁷ (£m, 2022-23 prices)
Anglian Water	1,074,034	111,217	962,817	119.3
Dŵr Cymru	439,266	105,953	333,313	41.3
Hafren Dyfrdwy	15,540	5,480	10,060	1.3
Northumbrian Water	530,492	298,988	231,504	28.7
Severn Trent Water	392,969	178,306	214,663	26.6
South West Water	446,180	55,938	390,242	48.4
Southern Water	984,926	145,035	839,891	104.1
Thames Water	758,776	197,246	561,531	69.6
United Utilities	419,751	177,651	242,100	30.0
Wessex Water	184,344	94,748	89,596	11.1
Yorkshire Water	1,400,043	127,320	1,272,723	157.7
Affinity Water	354,913	129,176	225,737	28.0
Bristol Water	134,415	76,402	58,012	7.2
Portsmouth Water	68,194	40,210	27,984	3.5
South East Water	319,991	87,815	232,176	28.8
South Staffs Water	52,298	44,911	7,387	0.9
SES Water	202,530	22,869	179,661	22.3
Sector total	7,778,662	1,899,264	5,879,398	728.7

2.2.3 Phosphorus removal base cost adjustment

What we said in our draft determinations

We applied a sector wide phosphorus cost adjustment of around £417 million to fund the ongoing operating expenditure (opex) associated with PR19 phosphorus removal enhancement schemes. Companies will incur these additional costs to comply with tight phosphorus permits upon delivery of their programmes in the 2020-25 price control period, including additional energy and chemical costs.

We determined the cost adjustment using a scheme level econometric benchmarking model with two cost drivers that are the most important in determining additional ongoing opex from phosphorus removal from an engineering and economic perspective:

³⁶ Including meter replacements delivered through the accelerated process reported in business plan data table CW7a.

³⁷ Reported in pre-frontier shift and RPE terms and rounded to one decimal place.

- **Population equivalent (PE) served** as a key scale / volume cost driver.
- **Enhanced phosphorus permit level** to capture differences in treatment complexity at different sewage treatment works.

We excluded schemes from the econometric model where enhancements were from a pre-existing historical phosphorus permit level (for example from a historical permit level of 2mg/l to an enhanced permit level of 0.5mg/l). We did this because the reported enhancement opex for these schemes is the incremental opex from the historical to the enhanced permit. This is not the total opex associated with meeting an enhanced permit. So, using these schemes would underestimate the efficient total ongoing costs associated with different enhanced phosphorus permit levels. This approach is conservative as it funds the total ongoing opex at all sites in scope of the PR19 phosphorus removal programme (rather than the reported incremental enhancement opex).

We determined the cost adjustment for each company by summing the efficient ongoing opex for all relevant schemes, and then applying an upper quartile efficiency challenge for consistency with other base costs.

Stakeholders' representations

Stakeholders generally supported or did not comment on our phosphorus removal sector wide cost adjustment. Only Severn Trent Water and Yorkshire Water challenged our approach:

- Severn Trent Water proposed to include AMP6 phosphorus removal schemes in the cost adjustment; and remove schemes with opex equal to, and less than, zero.
- Severn Trent Water and Yorkshire Water recommended a log functional form.
- Severn Trent Water and Yorkshire Water suggested a PE served quadratic variable
- Yorkshire Water suggested a 0.5 and below phosphorus permit dummy variable.
- Severn Trent Water proposed to use cross-section instead of panel data models.
- Yorkshire Water suggested a median catch-up efficiency benchmark instead of the upper quartile benchmark used at draft determinations.

Our assessment and reasons

Dataset

Severn Trent Water propose the inclusion of AMP6 phosphorus removal schemes in the cost adjustment. It states the opex for these schemes will not be fully accounted for within our base cost models. We retain our draft determination view that only the ongoing opex impact of PR19 phosphorus removal enhancement schemes is in scope of the adjustment. We do not fund ongoing opex of phosphorus removal enhancement schemes delivered prior to PR19. Historical phosphorus permit levels prior to 2020-21 were not as tight. The implicit allowance from the wastewater network plus models is sufficient as these costs fall within the sample

period 2011–24 we use to benchmark wastewater network plus base costs. There is also no scheme level data available to support such an adjustment. Our current approach is conservative given we fund the total ongoing opex at all sites in scope of the PR19 phosphorus removal programme (and not the reported incremental enhancement opex).

We have removed schemes with opex equal to, and less than, zero from the dataset to address feedback received from Severn Trent Water.

We note our dataset includes the list of 44 green recovery schemes belonging to Severn Trent Water which are scheduled for delivery in the 2020–25 price control period. This is consistent with our approach at draft determinations.

Functional form

Severn Trent Water and Yorkshire Water recommend using a log functional form. Both companies state that there are economies of scale (ie costs increase at a decreasing rate with population equivalent served) and using log models leads to more intuitive results. Yorkshire Water views a linear model leads to a constant impact of the permit level on costs irrespective of the size of the scheme. It views this to not be consistent with engineering rationale.

We retain our draft determination approach of not transforming the variables into logs before estimating the econometric model for three reasons:

- Taking logs and transforming model predicted costs back into levels by taking the exponential introduces substantial log-bias in our scheme level model. Log-bias is a downward bias in model predicted costs for the sector, which would lead to allowances being set too low. We cannot readily apply the PR19 log bias adjustment, which corrects the log-bias by implementing an upwards adjustment to model predicted costs equal to the percentage difference between industry requested costs and industry model predicted costs. This is because the industry request includes a subset of schemes that request incremental opex where enhancements are from a pre-existing historical phosphorus permit level. But we fund the total ongoing opex for all schemes. This means industry requested costs and industry model predicted costs are not comparable on a like-for-like basis. Therefore, we cannot readily apply the PR19 log bias adjustment.
- The results from the linear model are intuitive from an engineering and economic perspective. Economies of scale are accounted for through the intercept term, which is fixed and therefore the same for sewage treatment works (STWs) of any size. Therefore, all else being equal, smaller STWs get a higher opex allowance per PE due to the fixed intercept being spread over a lower PE served.
- It is consistent with our approach to assessing phosphorus removal enhancement.

Cost drivers

Severn Trent Water and Yorkshire Water both suggest including a PE served quadratic variable, which they consider captures a decreasing economies of scale effect for very large STWs. They also note that the models pass the RESET test when the quadratic scale variable is included (in combination with the use of log functional form). We disagree with the use of a PE served quadratic variable. Both water companies did not provide strong engineering and economic rationale to support its use. We consider both water companies used a PE served quadratic variable to offset the relatively stronger impact of economies of scale on opex in a log-linear model. We do not include a PE served quadratic variable in our selected model as we retain our draft determination approach of using a linear model. We view the constant marginal impact of PE served on costs in a linear model provides large STWs with a sufficiently high opex allowance to comply with tight phosphorus permits.

Yorkshire Water suggested a 0.5 mg/l and below phosphorus permit dummy variable to help account for a step-change in costs that occur at tight permit levels. We do not include this in our selected model as our analysis suggests it does not have a material impact on efficient expenditure.

Cross-sectional data

Severn Trent Water does not agree with the use of a panel dataset. It argues that allowing for annual observations for each scheme only generates noise as, once a scheme is delivered, constant opex values are associated with varying levels of PE served. On this basis, Severn Trent Water suggest modelling only on the final year of observations for each site. We agree that cross-sectional models can mitigate some of the noise in the dataset and allow each scheme to have the same weight in the model. Our selected model specification continues to produce robust results when using cross-section data. So, for final determinations we do not use random effects panel data estimation as we do not model schemes with a yearly time dimension. So, we estimate our model using cross-section data based on the first full year of opex data for each scheme using ordinary least squares (OLS).

Catch-up efficiency challenge

Yorkshire Water suggest the use of a median benchmark. It considers the wide range in efficiency scores suggest uncertainty in our modelling approach. We disagree with Yorkshire Water. We have a narrower range in efficiency scores compared to our draft determinations and this suggests greater certainty in our modelling approach. We consider an upper quartile sets an achievable catch-up efficiency challenge for the sector as it leads to a cost adjustment that similar to what companies are currently spending and requesting in draft determination representations. This is likely to be why no other company other than Yorkshire Water challenged the application of the upper quartile catch-up efficiency benchmark in draft determination representations. Applying a median benchmark would not

be stretching, and would lead to customers overpaying. So, we retain the upper quartile catch-up efficiency challenge.

For final determinations, we calculate the catch-up efficiency challenge based on modelled costs after the removal of outliers. This contrasts with our draft determinations approach of including outliers and non-outliers in this calculation. This change means that the catch-up efficiency challenge is not influenced by outliers that can have a significant impact on the calculated efficiency challenge. This is also consistent with our assessment of phosphorus removal enhancement.

Our final determination

For our final determination, we retain our approach to apply the sector wide phosphorus removal cost adjustment. The most significant changes to our approach are:

- we use ordinary least squares (OLS) based on a cross-section dataset instead of random effects panel data estimation; and
- we calculate the catch-up efficiency challenge based on modelled costs after the removal of outliers (instead of including outliers and non-outliers in the calculation).

We retain the same cost drivers we used at our draft determinations, which we consider are the most important from an engineering and economic perspective:

- **Population equivalent (PE) served** as a key scale / volume cost driver. PE served captures the size of the sewage treatment works (STWs) that need to comply with the enhanced phosphorus removal permits. Larger works serving a larger PE require higher efficient ongoing costs due to increased power and chemical costs; and
- **enhanced phosphorus permit level** to capture differences in treatment complexity at different sewage treatment works. Engineering rationale suggests an inverse relationship with costs; the higher (ie less tight) the permit level, the less phosphorus has to be removed for a given input level and therefore the lower the ongoing opex required to achieve it. For example, tighter permits might require companies to incur higher ongoing opex associated with more complex tertiary treatment processes and / or additional chemical dosing.

Our updated phosphorus removal base cost adjustment is around £522 million for the sector, representing an increase of around 25% relative to draft determinations. This is mostly the result of the changes in approach discussed above and a higher sector request (largely driven by Severn Trent Water, Yorkshire Water and Wessex Water). The adjustment provides companies with sufficient allowances to comply with enhanced phosphorus permit levels in the 2025–30 period. Please see the phosphorus removal base cost adjustment feeder model for further details.

2.2.4 Net zero base cost adjustment

What we said in our draft determinations

Companies need to reduce their greenhouse gas (GHG) emissions to contribute to the achievement of UK and Welsh government net zero targets. To do this, companies need to reduce the emissions they have direct control over as rapidly as reasonably practicable, for example, emissions from the use of vehicles and heating.

We introduced a sector-wide base cost adjustment for net zero at draft determinations. Adopting low-carbon technologies, such as electric vehicles, requires supporting infrastructure. The net zero cost adjustment is intended to enable companies to invest in this supporting infrastructure to reduce emissions from the use of vehicles and heating.

Seven companies submitted schemes for net zero enhancement for electric vehicle charging points and the installation of heat pumps in business plans. We did not fund these schemes through enhancement as some companies are likely to be delivering this through base expenditure allowances, and these technologies are likely relevant to all companies. However, as we want companies to deliver a step change in reducing greenhouse gas emissions, in the 2025–26 to 2029–30 period, we have used these schemes to determine the net zero cost adjustment for the sector to achieve this change.

We benchmarked companies submitted scheme benefits (reduction in tonnes of CO₂e (tCO₂e)) and costs (£ / tCO₂e) for water and wastewater. We applied the median reduction in tCO₂e –2.5% for water and –2.5% for wastewater to all companies to arrive at the benefits companies should deliver. The median unit cost of carbon was set at £760 per tCO₂e for water and for wastewater for each company.

Stakeholder representations

Companies largely welcome our recognition of the additional costs of the net zero transition. Anglian Water and Northumbrian Water consider that the amount of funding is broadly in line with their plans for transitioning their fleets in the 2025–2030 period. South East Water, Wessex Water, Yorkshire Water and Severn Trent Water are concerned that varying maturities and circumstances have not been taken into account in determining the cost adjustment. South West Water does not agree with the net zero cost adjustment.

There was broad agreement across company representations that the level of stretch (the expected emissions reduction) is not deliverable for the amount of funding provided. Hafren Dyfrdwy, Severn Trent Water and Yorkshire Water argue the benefits companies can deliver in 2029–30 should be used to determine the level of stretch, rather than cumulative benefits over the 2025–30 period. This is because the majority of benefits from electric vehicle (EV) charging infrastructure and low-carbon heating will not be delivered until later in the 2025–2030 period as it takes time to install new infrastructure. In addition, they consider that

using the benefits from 2029–30 would be more aligned with our approach for setting companies' performance commitment targets for greenhouse gas emissions reductions.

Seven companies provided representations related to the marginal costs of EVs.³⁸ They argue that transitioning their fleets to EVs is an enhancement activity because EVs involve additional costs above like for like replacement with petrol or diesel vehicles and changes in operational processes.

Our assessment and reasons

In their representations, companies provided additional or updated emissions benefits data, which we have used in our analysis for final determinations.

We use companies' forecasted 2029–30 benefits to determine the level of stretch for the cost adjustment instead of the cumulative scheme benefits over the 2025–30 period. We accept it is likely that the investment in supporting infrastructure to reduce emissions from the use of vehicles and heating will see limited emissions reductions during years 1–3 of the 2025–30 period, with the majority of benefits being delivered in years 4 and 5. Using companies' forecasted 2029–30 benefits results in a stretch of 1.2%.

We retain our approach to determining how the cost adjustment is calculated, as we had minimal feedback from stakeholders. This uses companies cumulative scheme benefits to determine the median unit cost of carbon (£758). This is higher than the UK Government's market cost of carbon forecast of £87 in 2030 because the cost adjustment allows companies to invest in infrastructure to reduce emissions from heating and transport, which will deliver benefits over future price control periods.³⁹ This results in a sector cost adjustment of £26 million adjustment for water, and a £40 million adjustment for wastewater.

We do not provide additional allowances for the marginal costs of electric vehicles. We expect companies to replace and upgrade transport with base expenditure allowances. We recognise that costs will initially be higher for replacing petrol or diesel vehicles with EVs. But the incremental costs are immaterial when considered alongside future opex and capital maintenance savings⁴⁰, and the scale of base expenditure allowances at PR24. Companies will also receive allowances through the base expenditure econometric models at future price

³⁸ Affinity Water, Hafren Dyfrdwy, Severn Trent Water, South East Water, Thames Water, United Utilities and Wessex Water.

³⁹ Department for Energy Security & Net Zero, '[Traded carbon values used for modelling purposes, 2023](#)', 2023.

⁴⁰ Department for Transport, '[Zero Emission Vehicle Mandate and CO2 Regulations: Joint Government Response Cost Benefit Analysis](#)', October 2023.

reviews. Water companies should plan for the transition to EVs in light of the Zero Emissions Vehicle mandate.⁴¹

Our final determination

We apply a sector wide net zero cost adjustment of £26 million for water and £40 million for wastewater. Companies are required to reduce greenhouse gas emissions for water and wastewater by an additional 1.2% with base expenditure allowances.

Having considered stakeholder responses, the key change in our approach from draft determinations is that we have used companies' forecasted 2029-30 benefits to determine the reduction in GHG emissions companies must deliver with the cost adjustment, instead of cumulative scheme benefits over the 2025-30 period. This reduces the level of stretch for the cost adjustment making it more achievable.

We will hold companies to account for delivery of supporting net zero infrastructure with the cost adjustment through three actions.

- Stretching each company's greenhouse gas emissions PCL(s) to include the reductions they should deliver through the net zero base cost adjustment.
- Requiring all companies to report on activities related to the cost adjustment through the annual performance report (APR) process.
- We will return money to customers if companies do not deliver the supporting net zero infrastructure with the cost adjustment in the PR24 end-of-period reconciliation process.

2.2.5 Energy cost adjustment

What we said in our draft determinations

Since late 2021, there has been a substantial increase in wholesale energy prices. Wholesale electricity prices increased from an average of £72/MWh in the first six months of 2021, to an average of c. £210/MWh in 2022. This was driven by the recovery of the global economy after the Covid-19 pandemic and more recently by geopolitical events. Wholesale energy prices were still above long-term average levels when companies submitted their PR24 business plans in October 2023.

Energy costs are a material component of modelled base costs: 12% for water, and 15% for wastewater network plus. Water companies hedge future energy costs ahead of time, and to differing degrees remain protected from recent increases in energy prices. That said, by

⁴¹ Department for Transport, [Consultation outcome. Zero emission vehicle \(ZEV\) mandate consultation: summary of responses and joint government response](#), October 2023.

2025-26 almost all existing hedge agreements will expire and the sector will face energy prices (or enter new hedge agreements) that will reflect market conditions at the time.

This led to four companies submitting an energy cost adjustment claim (Anglian Water, Hafren Dyfrdwy, Severn Trent Water and Wessex Water). These companies argue that our base cost models do not explain the recent increase in energy costs beyond general inflation. Other companies also raised the issue in business plans, and suggested we apply a sector wide cost adjustment or include an energy cost driver in the base cost models. Water companies proposed energy cost adjustments of around £2 billion in PR24 business plans.

Energy prices have since fallen back substantially from the peak in 2022. But there remains significant uncertainty around the future path of energy prices caused by ongoing geopolitical events. So, in the round, we accepted the need for a sector wide energy cost adjustment and accompanying end-of-period true-up mechanism to account for this uncertainty at draft determinations. We sought advice from CEPA on how the cost adjustment should be calculated and how we should address uncertainty in relation to future energy prices, and their independent report was published alongside draft determinations.⁴²

Our sector wide energy cost adjustment incorporated an 'uplift factor' to bring modelled base costs up to market prices in the year 2022-23, as well as a Real Price Effects (RPE) adjustment to allowances, based on CEPA's forecast of a fall in energy prices derived from market expectations for energy prices over the 2025-26 to 2029-30 period.

This resulted in a relatively small and negative adjustment as a percentage of base allowances at -£204 million across water, wastewater network plus and bioresources as CEPA forecast energy prices to fall below the historical average energy price by 2025-26.

Additionally, to address the uncertainty around future energy prices, we introduced an ex-post true-up between forecast and outturn energy prices using the Department for Energy Security and Net Zero (DESNZ) industrial electricity price index for large industrial users.

Bioresources is different from water and wastewater network plus because many companies have facilities to generate energy (biomethane, electricity or heat) and sell this energy on – either to the wastewater network plus part of their of business, to the grid, or to third parties – and generate income. So, the bioresources business benefits from higher energy prices through higher income, which leads to lower base costs. CEPA developed an approach for bioresources to recognise that the energy price shock had positive effects on income, offsetting some of the costs across water and wastewater, details of which are contained within the above mentioned report.

⁴² CEPA, 'Frontier shift, real price effects and the energy crisis cost adjustment mechanism', June 2024.

Stakeholders' representations

General comments on the mechanism

Most water companies are supportive of the overarching principles of the energy cost adjustment, but have fundamental concerns around the way the ex-ante RPE forecast was calculated at draft determinations. In their view, this led to an energy cost adjustment that did not reflect the real increase in energy prices over 2023–24. We discuss this further below.

The companies also state the following:

- Northumbrian Water and Southern Water do not consider an ex-ante RPE should be applied – only an ex-post true-up using the outturn values of the DESNZ index.
- United Utilities argues that no energy adjustment is necessary and that companies are best placed to manage energy risk.
- Companies consider the mechanism should be updated to reflect the latest year of outturn data (2023–24).

The Consumer Council for Water (CCW) supported our draft determination approach. It states it protects customers from paying too much up front for what is a significant base cost driver in a volatile wholesale energy market. It also states the use of the DESNZ industrial index should incentivise companies to achieve cost-efficient deals from their suppliers.

Calculation of the ex-ante RPE forecast

Most water companies, as well as the report on energy costs by Baringa commissioned by WaterUK (the "Baringa report"), argue that the calculation of the ex-ante RPE forecast is wrong. More specifically, they disagree with the use of the Ofgem day ahead prices as the starting point for the RPE, which they say:

- is not representative of companies' energy costs as it does not include the impact of hedging; and
- results in an 'inappropriate' sharp negative RPE for the financial year 2023–24, whereas the DESNZ index increased from the financial year 2022–23 to the financial year 2023–24.

In summary, water companies consider the energy cost adjustment at draft determinations was too small because it underestimated the financial year 2023–24 DESNZ index. The DESNZ index appears to lag wholesale energy prices by between 1–2 years based on historical data due to hedging arrangements that large industrial users have in place. So, the DESNZ index is expected to peak in 2023–24 instead of 2022–23 (that we assumed at draft determinations) as large industrial users energy price hedges from before the energy crisis expire.

Calculation of the uplift factor and choice of index

Most water companies support the recommendations set out in the Baringa report, which suggests using the DESNZ extra-large non-domestic price data for the uplift and base year of the RPE as opposed to the DESNZ industrial index.

Baringa favours the use of DESNZ extra-large non-domestic price data because similarly to the day ahead prices, it has the advantage of being actual price data as opposed to an index (like the DESNZ industrial index we used for draft determinations) but has the advantage of incorporating the impact of hedging which the average day-ahead prices do not reflect.

Northumbrian Water argues the DESNZ industrial index does not account for Contracts for Differences⁴³ (CfD) costs and that the uplift should be calculated based on the most recent five years of data to align with the efficiency challenge as opposed to the entire historical period starting from 2011-12.

Ex-post true up mechanism

Several companies highlight that the negative adjustment we applied at draft determinations would have a negative cashflow and financeability impact (Hafren Dyfrdwy, SES Water, Severn Trent, Southern Water, Thames Water and United Utilities). Several companies subsequently suggested applying the ex-post true-up in-period rather than at the end of the 2025-30 period to mitigate the cash-flow risk (Affinity Water, Hafren Dyfrdwy, Severn Trent, Thames Water and Yorkshire Water). Southern Water also states that the true-up should be made through an opex adjustment (ie 100% allocated to pay-as-you-go revenue).

Our assessment and reasons

Calculation of the uplift factor and choice of index

We acknowledge that using DESNZ extra-large non-domestic price data for the uplift and RPE base year would address companies' concern that our draft determinations base year data (based on Ofgem day-ahead prices) does not reflect the impact of hedging.

But we would remain reliant on Bloomberg data and company submissions on third party charges to construct the forecasts out to 2029-30, which are inherently uncertain. Particularly when we do not know the exact length of the lag between wholesale energy prices and the DESNZ index.

We also remain of the view that the DESZN large industrial users energy price index is more appropriate than DESNZ extra-large non-domestic price data. The latter is based on the average unit value of sales to non-domestic customers, some of which are less relevant users

⁴³ A CfD is a financial agreement where the buyer agrees to pay the seller the difference between the current value of an asset and its value at the time the contract started.

(eg retail). The non-domestic survey methodology is also less transparent in how representative it is of the very large user population, resulting in concerns that the water companies might be able to influence the index in some cases. Additionally, some water companies consume less energy than extra-large non-domestic users (Portsmouth Water, South West Water (Bristol area), Hafren Dyfrdwy and SES Water).

We therefore continue to use the DESNZ industrial price index to calculate the uplift factor, but implement the modification outlined below when calculating the RPE forecast to address companies concerns on the mismatch between the uplift and RPE forecasts.

Calculation of the ex-ante RPE forecast

We acknowledge company arguments that our draft determinations RPE base year data (based on Ofgem day-ahead prices) does not reflect the impact of hedging. To address this, we have implemented an uplift factor reflecting energy prices in the latest historical year of data (2023-24), relative to the historical modelling period (2011-12 to 2023-24) using the DESNZ industrial price index, and then applied a six-year glidepath which eliminates the uplift by 2029-30. This approach resolves the main issue highlighted by companies that the uplift and RPE forecasts are not consistent, and also places less reliance on market data as the forecast RPE is just a straight line from the initial uplift value to a baseline of 1 by 2029-30. In our view, this is a pragmatic approach as a 'cross-check' against market evidence and the historical lag between the DESNZ index and wholesale energy prices suggests that the DESNZ industrial price index could return to the long-run historical index value in a shorter time frame (eg three-years).

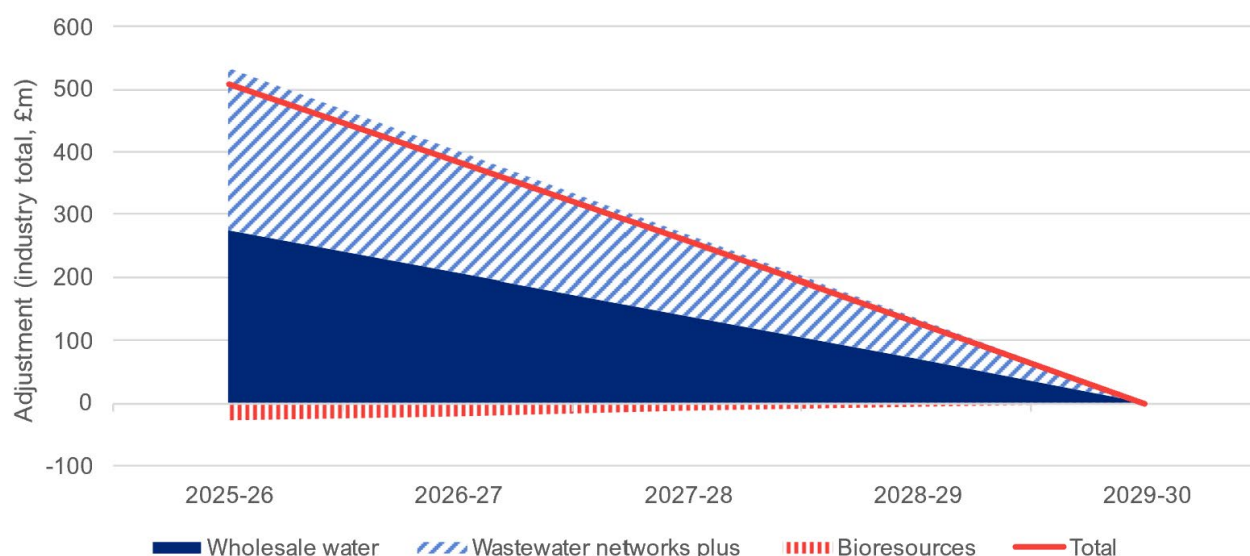
Ex-post true up mechanism

The changes we are implementing for final determinations lead to a larger and positive energy cost adjustment of £1.3 billion across the sector, which is line with the suggested energy cost adjustment in the Baringa report for Water UK. We consider this continues to encourage companies to manage volatility in energy prices and avoids the additional complexity and bill volatility from an in period true up. We therefore continue to apply the energy cost true-up between forecast and outturn DESNZ industrial price index at the end of the 2025-30 period. Please see 'CEPA's Frontier Shift, Real Price Effects and the energy crisis cost adjustment mechanism' report for more details.

Our final determination

In summary, our final determination approach consists of an uplift to allowances using the DESNZ industrial energy price index, and subsequently a six-year RPE glidepath which eliminates the uplift by the end of the 2029-30 period. This is illustrated in the figure below.

Figure 4: Proposed net adjustment to modelled efficient base costs, industry total (£m, 2022-23 prices)



Source: CEPA analysis

This leads to an energy cost adjustment of £1.3 billion across the sector, compared to a small negative adjustment of -£204 million at draft determinations. The below table sets out the adjustments per price control.

Table 6: Sector wide energy cost adjustment

Company	Wholesale Water energy adjustment (£m)	Wastewater network plus energy adjustment (£m)	Bioresources energy adjustment (£m)	Total energy adjustment (£m)
Anglian Water	58.49	63.43	-1.88	120.0
Dŵr Cymru	43.29	50.30	0.02	93.6
Hafren Dyfrdwy	4.25	1.00	-0.09	5.2
Northumbrian Water	48.83	40.38	-5.44	83.8
Severn Trent Water	109.73	95.17	-14.81	190.1
South West Water	36.23	30.03	2.79	69.1
Southern Water	15.97	45.98	-3.51	58.4
Thames Water	121.41	134.91	-16.18	240.1
United Utilities	61.95	93.79	-15.45	140.3
Wessex Water	12.11	33.86	-0.06	45.9
Yorkshire Water	50.92	64.25	-10.74	104.4
Affinity Water	47.09	0.00	0.00	47.1
Bristol Water	12.47	0.00	0.00	12.5
Portsmouth Water	5.17	0.00	0.00	5.2
South East Water	29.34	0.00	0.00	29.3

South Staffs Water	26.10	0.00	0.00	26.1
SES Water	6.58	0.00	0.00	6.6
Sector total	689.92	653.09	-65.35	1,277.7

We will then apply a true-up in the PR24 end-of-period reconciliation between forecast and outturn DESNZ industrial price index values. This will return money to customers if outturn energy prices faced by large industrial users are lower than forecast at the price review. Similarly, companies will be able to recover additional revenues from customers if outturn energy prices faced by large industrial users are higher than forecast at the price review.

We expect the energy cost adjustment and associated end-of-period reconciliation mechanism to be a temporary feature of the regulatory framework. We will re-assess the need for an energy cost adjustment and RPE at PR29.

The tables below present the energy RPE index and power cost shares used to determine the energy cost adjustment at PR24 final determinations, and will be used to deliver the end-of-period reconciliation alongside outturn DESNZ industrial price index values.⁴⁴

Table 7: Energy RPE index applied at PR24 final determinations to calculate the energy cost adjustment

	2025-26	2026-27	2027-28	2028-29	2029-30
Energy RPE index (PR24 final determinations)	1.489	1.367	1.245	1.122	1.000

Table 8: Power cost shares used to determine the energy cost adjustment at PR24 final determinations

	Wholesale water	Wastewater network plus	Bioresources
Anglian Water	13.7%	13.9%	-1.8%
Dŵr Cymru	14.0%	17.7%	0.0%
Hafren Dyfrdwy	13.4%	16.1%	-8.8%
Northumbrian Water	14.2%	20.4%	-12.5%
Severn Trent Water	15.7%	16.1%	-8.8%
South West Water	18.0%	18.2%	7.8%
Southern Water	7.9%	10.3%	-5.3%
Thames Water	10.7%	14.6%	-9.6%
United Utilities	10.3%	16.4%	-13.0%
Wessex Water	9.7%	15.0%	0.0%
Yorkshire Water	12.3%	14.9%	-9.5%

⁴⁴ DESNZ industrial electricity index including climate change levy. Seasonally adjusted quarterly data: Electricity (Current fuel price index numbers). Data available here: [Industrial energy price indices - GOV.UK](#): Table 3.3.2 column H and I. Financial year index value based on the average of quarterly values during the financial year.

	Wholesale water	Wastewater network plus	Bioresources
Affinity Water	15.7%		
Bristol Water	12.9%		
Portsmouth Water	11.2%		
South East Water	15.3%		
South Staffs Water	19.9%		
SES Water	14.1%		

2.2.6 Network reinforcement cost adjustment

What we said in our draft determinations

Network reinforcement includes the provision or upgrading of network assets to supply new customers with no net deterioration of existing levels of service. We include historical network reinforcement expenditure in the scope of modelled base costs. We invited companies to submit cost adjustment claims if they expected to deliver more network reinforcement than is funded through the base cost models.

At draft determinations we assessed three cost adjustment claims for network reinforcement:

- Thames Water: £157.0 million (water); £83.0 million (wastewater).
- South East Water: £31.2 million (water).
- Southern Water: £10.6 million (wastewater).

We partially accepted Thames Water's claim, allowing the company £78.5 million for water network plus and £41.5 million for wastewater network plus. Thames Water has historically experienced the highest growth in connected properties out of all companies, and this was expected to continue over the 2025–30 period.

At PR19 we accepted that the base cost models may under-remunerate companies in high growth areas and over-remunerate companies in low growth areas. In draft determinations our analysis suggested that Thames Water was spending more on network reinforcement in the 2020–21 to 2024–25 period than was reflected in its base expenditure allowance at PR19.

For the Thames Water claim it was not clear that cost benefit analysis had been used to choose between options, and it did not provide an account of its optioneering process for the wastewater network reinforcement claim. We applied a 10% optioneering challenge to reflect this. We also applied a 20% base overlap challenge because we were concerned about the overlap with capital maintenance, and a 20% cost efficiency challenge because it was not clear how efficient costs had been calculated for each scheme, and whether any benchmarking analysis had been performed to determine efficient costs. Overall, we applied a 50% cost challenge to the requested amount.

Finally, we introduced a price control deliverable (PCD), which would return money to customers if Thames Water delivered less network reinforcement than is included in its ex-ante PR24 base expenditure allowance. The adjustment would be based on the difference between the ex-ante network reinforcement allowance (implicit allowance plus cost adjustment) and outturn network reinforcement costs over the 2025-26 to 2029-30 period. We said we would consider reducing the size of the ex-post revenue adjustment if Thames Water provided compelling evidence that part of the underspend is the result of efficiencies rather than changes in the volume and mix of new connections.

We rejected South East Water's network reinforcement claim. We recognized the company operates in a relatively high growth area. But it did not provide compelling evidence to demonstrate that it faces unique circumstances. We invited South East Water to provide additional evidence to demonstrate the need for a cost adjustment in response to our draft determinations. In particular, we requested further detail on what the cost adjustment claim will deliver for developer services customers based on planned new developments in the 2025-30 period.

We rejected Southern Water's network reinforcement claim as it was immaterial.

Stakeholders' representations

Thames Water disagreed with the cost challenges we applied to its claim. On the base overlap challenge, it referred back to query responses where it stated how proposed costs had been allocated proportionately between cost lines. On the optioneering challenge, it stated that further optioneering would take place when the projects were initiated. Finally on cost efficiency, it stated its costs were based on historical costs plus an efficiency challenge. In its view it did not warrant a further cost efficiency challenge.

South East Water increased the amount of its claim from £31.2 million to £44.5 million due to a unit cost increase and an increase in its new connections forecast. It provided more evidence to demonstrate the need for a cost adjustment:

- It has sustained larger growth than the remainder of the sector since 2015, except for Thames Water and South West Water.
- It operates in a non-industrialised area, and therefore does not benefit from a 'de-industrialisation windfall' in terms of freeing up capacity built for industrial customers.
- It spends relatively more on network reinforcement than other companies.

Southern Water increased its wastewater network plus network reinforcement cost adjustment claim from £10.6 million to £49.8 million. It claims this is the result of higher growth than originally forecast.

We also received three new network reinforcement claims from Severn Trent, Anglian Water and South West Water with draft determinations representations:

- Severn Trent: £62.7 million for water network plus and £178.4 million for wastewater network plus.

£29.8 million of its claim, £16.2 million for water and £13.6 million for wastewater, is because of unexpected non-household growth. The company has received five formal applications since October 2023 for large non-household developments, which it considers requires higher than expected network reinforcement.

£211.3 million of the claim is to accommodate household growth, £46.5 million for water and £164.8 million for wastewater. The latter is almost in its entirety due to the company's bottom-up review of its wastewater network reinforcement needs identifying that the top-down modelled approach used in its business plan submission would be inadequate to support the future level of development projected.

Severn Trent Water references the need for additional investment highlighted by the UK Government and the extension of the growth duty to Ofwat.⁴⁵

- Anglian Water: £60.9 million for wastewater network plus. The company increased its requested wastewater network reinforcement spend to align its PR24 business plan to its final Drainage and Wastewater Management Plan (DWMP) published last summer using higher growth and climate change forecasts.
- South West Water: £42.0 million for water network plus. The company considers the network reinforcement in its plan is not adequately funded as we have assessed network reinforcement as part of our modelled base costs rather than separately.

Our assessment and reasons

Following the receipt of the six network reinforcement cost adjustment claims mentioned above, we engaged with companies through our query process to understand the evidence and planned developments underpinning their proposed need for investment.

Severn Trent Water provided a breakdown of planned developments making up its network reinforcement claim. For both water and wastewater, it classed its developments as medium to high confidence of being completed, with the project stages ranging from ongoing negotiations with developers and developments confirmed to projects having been started on site or completed.

⁴⁵ <https://www.gov.uk/government/publications/growth-duty>

Anglian Water classed all the wastewater developments making up its claim as high confidence, and provided detailed evidence of its engagement with developers and local authorities with regards to their planned developments.

Southern Water classified all its wastewater network reinforcement developments as high confidence of being completed, with all the projects being at designing stage.

South West Water classed all the developments making up its water network reinforcement claim as high confidence, as building work has already started.

Overall, we are satisfied with the level of certainty on project development provided by the companies, but still have concerns around the large increase in requested network reinforcement expenditure that we have received at this late stage after business plans submissions. However, to avoid delays in development growth, we have introduced a sector wide network reinforcement cost adjustment for final determinations of over £700 million, which we discuss further below. This will support economic growth and help to facilitate the Government's target to build 1.5 million new homes in England over the next five years.

We are concerned that the level of requested investment might reflect historical under investment in network reinforcement given that companies are forecasting material increases in network reinforcement unit costs in the 2025–30 period. Our analysis shows industry wide total network reinforcement spend over the 2025–30 period is 1.9 times greater than in the last five years of outturn for water and 2.6 times for wastewater. We explain how we taken this into account below.

Our final determination

We apply a sector wide network reinforcement cost adjustment of £733.5 million to account for higher network reinforcement investment that companies are forecasting in the 2025–30 period to facilitate growth (household and non-household). We will claw back this expenditure if it is not used on network reinforcement through a price control deliverable.

To calculate the cost adjustment we:

- (a) calculated network reinforcement expenditure over the 2025–30 period for each company based on requested expenditure in draft determination representations.
- (b) estimated the implicit allowance from the base cost models;
- (c) calculated a PR19 under-delivery adjustment for companies who have spent less on network reinforcement than was allowed over the 2020–25 period; and
- (d) calculated a cost efficiency challenge based on each company's unit costs over the 2025–30 period compared to the industry median cost, as described below.

The cost adjustment for each company is calculated as (a) minus (b) minus (c). We then apply the cost efficiency challenge (d). This is shown in the table below.

Steps (b) and (c) are so that customers do not pay twice for network reinforcement. We only apply positive network reinforcement cost adjustments given we did not consult on this proposal at draft determinations. We will revisit this for PR29.

We will hold companies to account for delivery of network reinforcement through a price control deliverable. More details are provided in 'PR24 final determinations: price control deliverables' appendix.

Setting a cost efficiency challenge over the 2025–30 period

To calculate a cost efficiency challenge, we have compared each company's unit cost over the 2025–30 period to the industry median unit cost, defined as network reinforcement spend per new property.⁴⁶

Rather than apply the median unit cost for every company, we have applied a less stretching cost efficiency challenge by capping the efficiency challenge at 10% when the gap to the median unit cost is less than 50%, and at 20% when the gap to median unit cost is more than 50%. This recognises that network reinforcement requirements over the 2025–30 period are not solely driven by forecast growth over the 2025–30 period, and may reflect differences in headroom capacity between companies, leading to varying unit costs.

Network reinforcement implicit allowance from the PR24 base cost models

To calculate the implicit allowance, we have taken the average of the results from two methods, recognising there is no perfect approach to estimating the implicit allowance:

1. Applying an efficiency challenge to the last five years of outturn network reinforcement expenditure, where the efficiency challenge is based on the comparison between the wholesale water and wastewater network plus outturn costs for the last five years and the upper quartile efficient costs for the same period.
2. Applying the industry average network reinforcement spend as a percentage of wholesale costs to the wholesale water and wastewater network plus 2025–30 allowances.⁴⁷

⁴⁶ To calculate the median unit cost, we exclude SES Water for the water price control as it presents a very low unit cost, and Hafren Dyfrdwy for the wastewater price control as it presents a very high unit cost.

⁴⁷ To avoid any undue impact from companies which are outliers in terms of percentage network reinforcement spend when compared to the rest of the industry, we have applied the Interquartile Range (IQR) method. This is important to avoid companies with very high or very low network reinforcement spend as a percentage of wholesale costs skewing the sector average percentage of network reinforcement spend, leading to very high or very low implicit allowances which would not be representative of the sector.

We present an illustrative example for both approaches in the figure below:

Figure 5: PR24 network reinforcement implicit allowances – approach 1

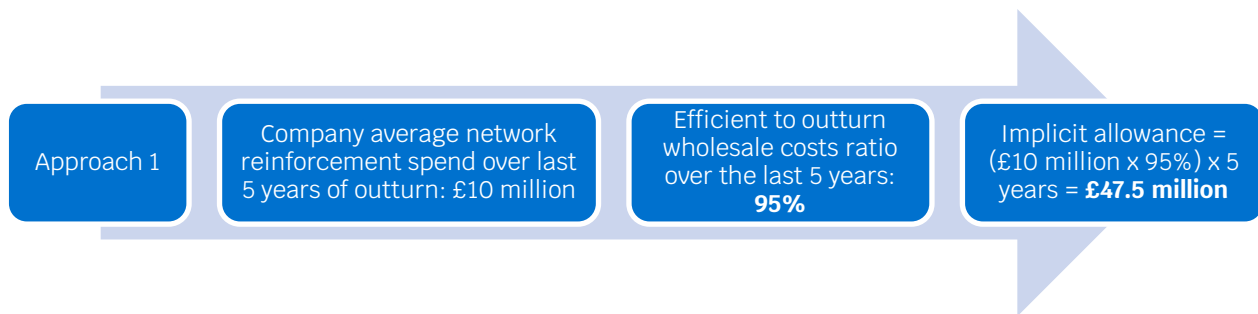
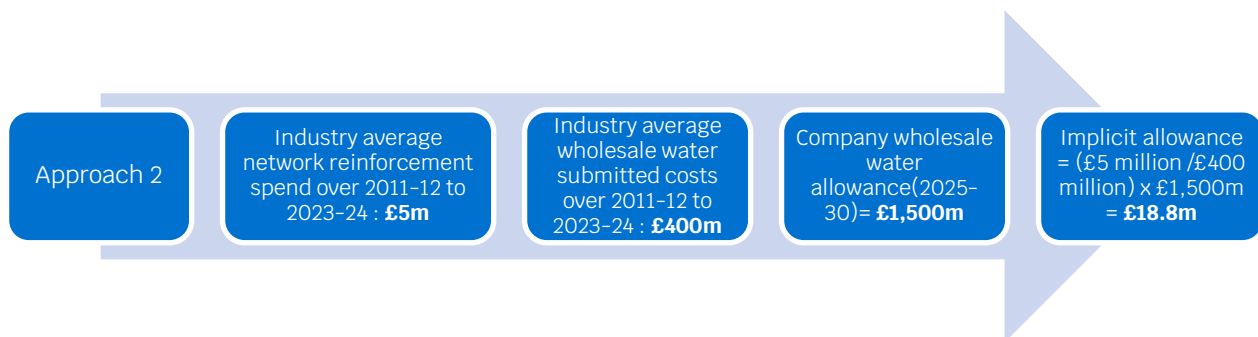


Figure 6: PR24 network reinforcement implicit allowances – approach 2



The above two methods were used by Thames Water in the development of its network reinforcement cost adjustment claim at the time of business plans submissions.

We also considered calculating the implicit allowance by removing historical network reinforcement spend from our wholesale base econometric models but decided not to use this approach. Historical network reinforcement costs comprise a small percentage of wholesale base costs. So, removing these costs from the models sometimes leads to estimates of the implicit allowance that are not reliable. Uncertainty over the consistency of company cost allocation between network reinforcement and capital maintenance over the historical period creates further concerns with this approach. For example, Yorkshire Water and Portsmouth Water reported zero network reinforcement spend between 2011-12 and 2016-17 despite reporting population growth over the period. Concerns over the reliability of cost allocation between network reinforcement and capital maintenance was one of the main reasons why we assessed network reinforcement as part of modelled base costs at PR24.

PR19 under-delivery adjustment

So that customers do not pay twice for network reinforcement, we have applied an under-delivery adjustment to companies which did not spend as much on network reinforcement as was allowed at PR19.

For consistency with the PR24 approach, we have used the average of the same two methods above to calculate a PR19 implicit allowance, adjusting the dates accordingly:

- When applying an efficiency challenge to the last five years of outturn network reinforcement expenditure for the period, we have used the 2014-15 to 2018-19 period⁴⁸ for the calculation of both the efficiency challenge (proportion of efficient costs over outturn spend for the relevant price control) as well as for the calculation of historical network reinforcement spend.
- When applying the industry average network reinforcement spend as a percentage of wholesale costs to the relevant price control allowances, we have used historical network reinforcement spend over the 2011-12 to 2018-19 period as a proportion of wholesale costs for the same historical period.

We calculate the adjustment based on the difference between the implicit allowance and forecast spend over the 2020-21 to 2024-25 period. We also take into account PR19 cost sharing outperformance rates to account for the proportion of the underspend that has already been returned to customers via cost sharing.

Overall, as set out below, the PR19 network reinforcement under-delivery adjustments total £6.6 million for wholesale water and £9.7 million for wastewater network plus.⁴⁹

Table 9: Water network reinforcement sector wide cost adjustment

Company	2025-30 network reinforcement spend (a)	PR24 implicit allowance (b)	PR19 under delivery adj. (c)	Cost adj. (pre efficiency challenge) (£m) (a - b - c)	Efficiency challenge (d)	Cost adj. (post cost efficiency challenge) (a - b - c) x (1 + d)
Anglian Water	57.4	40.8	3.6	13.0	-10.0%	11.7
Dŵr Cymru	13.8	6.4	0.5	6.9	0.0%	6.9
Hafren Dyfrdwy	0.3	0.6	0.1	0.0	0.0%	0.0
Northumbrian Water	12.5	12.4		0.1	0.0%	0.1
Severn Trent Water	116.2	39.5		76.7	-20.0%	61.3
South West Water	14.2	3.7	0.6	9.9	0.0%	9.9
Southern Water	28.3	3.8	0.3	24.1	-10.0%	21.7
Thames Water	187.7	45.9		141.8	-20.0%	113.4
United Utilities	80.1	24.0		56.1	-5.0%	53.3
Wessex Water	9.4	3.6	1.4	4.4	0.0%	4.4
Yorkshire Water	37.7	22.7		15.0	-3.7%	14.5
Affinity Water	28.8	19.2		9.7	-10.0%	8.7
Bristol Water	4.2	5.5		0.0	0.0%	0.0

⁴⁸ This corresponds to the last five years of outturn for PR19

⁴⁹ For exact calculation details, please refer to our published network reinforcement excel model.

Company	2025-30 network reinforcement spend (a)	PR24 implicit allowance (b)	PR19 under delivery adj. (c)	Cost adj. (pre efficiency challenge) (£m) (a - b - c)	Efficiency challenge (d)	Cost adj. (post cost efficiency challenge) (a - b - c) x (1 + d)
Portsmouth Water	4.2	1.8		2.4	0.0%	2.4
South East Water	59.2	19.0		40.2	-20.0%	32.2
South Staffs Water	11.3	6.4		4.9	0.0%	4.9
SES Water	0.0	0.8	0.2	0.0	0.0%	0.0
Sector total	665.2	256.2	6.6	405.1		345.4

Table 10: Wastewater network reinforcement sector wide adjustment

Company	2025-30 network reinforcement spend (a)	PR24 implicit allowance (b)	PR19 under delivery adj. (c)	Cost adj. (pre efficiency challenge) (£m) (a - b - c)	Efficiency challenge (d)	Cost adj. (post cost efficiency challenge) (a - b - c) x (1 + d)
Anglian Water	88.9	36.3	4.3	48.4	-10.0%	43.5
Dŵr Cymru	8.8	14.8		0.0	0.0%	0.0
Hafren Dyfrdwy	0.0	0.2	0.0	0.0	-20.0%	0.0
Northumbrian Water	7.6	8.8		0.0	0.0%	0.0
Severn Trent Water	200.4	24.3	3.6	172.5	0.0%	138.0
South West Water	25.5	10.5		15	-10.0%	13.5
Southern Water	62.9	37.2		25.7	-6.0%	24.1
Thames Water	124.3	49.7		74.6	0.0%	74.6
United Utilities	88.2	29.3		58.9	0.0%	58.9
Wessex Water	29.1	13.6		15.5	0.0%	15.5
Yorkshire Water	38.8	15.0	1.7	22.1	-10.0%	19.9
Sector total	674.5	239.5	9.7	432.7		388.2

2.3 Unmodelled base expenditure allowances

We assess separately a small number of base cost items either because they are largely outside of company control or are only incurred by a subset of water companies. Unmodelled base costs at final determinations are made up of:

- business rates;
- abstraction and discharge charges (water and wastewater);
- costs associated with the Traffic Management Act (TMA) and lane rental schemes;
- wastewater Industrial Emissions Directive operating costs;
- third-party services costs;
- developer services and diversions (excluding network reinforcement);

- non-household retail (Dŵr Cymru and Hafren Dyfrdwy);
- pension deficit recovery payments; and
- equity issuance costs.

For final determinations, we assess Environment Agency water quality permit costs as part of unmodelled base costs instead of in the wastewater network plus and bioresources base cost models. This is because of the step-change in costs expected in the 2025–30 period following the outcome of the Environment Agency's January 2024 consultation on water quality permit charges, which will increase costs for wastewater companies.

Unmodelled base costs total £8.9 billion in draft determination representations, with the majority attributable to business rates (£4.3 billion).⁵⁰

Our unmodelled base expenditure allowance for final determinations is £8.8 billion. This is 1% below company proposals in draft determinations representations, but 27% higher than our allowance at draft determinations. The increase in the allowance at final determinations is driven largely by our decision to incorporate a forecast of the impact of planned business rates revaluations in 2026 and 2029 in allowances, and our decision to assess water quality permit costs as part of unmodelled base costs.

We set out our approach to assessing unmodelled base costs, and demonstrate how we have considered stakeholder responses, in the subsections below.

2.3.1 Business rates

What we said in our draft determinations

Business rates are charged on non-domestic properties such as offices and factories. Cumulo rates refer to rates on land and buildings where operating assets are held (eg a water treatment works). We use the term business rates collectively to include business rates and cumulo rates.

Business rates were last revalued in 2023. Further revaluations are expected in 2026 and 2029. Companies forecast a variety of impacts on business rate liabilities of these revaluations in their business plans.

We set allowances based on rateable values set at the 2023 revaluation and the 2023–24 multiplier set by central government. We did not reflect the revaluations due in 2026 and 2029 in our allowances or increases in business rates due to changes in wastewater asset stock in the period 2025–30.

⁵⁰ Excluding pension deficit recovery payments and equity issuance costs.

We recognise that companies have limited control over business rates. Given the high degree of uncertainty around revaluations over the 2025–30 period, we proposed to increase cost sharing rates, so that companies recover 90% of any costs in excess of its PR24 cost allowance, and customers recover 90% of the amount by which their costs are lower than PR24 allowances.

Stakeholders' representations

Almost all companies disagree with our approach to business rates at draft determinations.

Companies state that we should take account of planned revaluations in 2026 and 2029. They highlight the burden placed on companies in-period without an up-front allowance and that 10:10 cost sharing rates are only appropriate if a central estimate of likely cost changes is included in allowances.

Northumbrian Water and Thames Water consider that without an up-front allowance it will lead to bill volatility at PR29 when these costs are reconciled.

Hafren Dyfrdwy, Severn Trent Water, United Utilities, Yorkshire Water and South East Water suggest that business rates are reconciled in-period should we not include a central estimate of the revaluations in allowances.

Dŵr Cymru and Portsmouth Water consider that business rates should be included as a Notified Item.

Our assessment and reasons

We agree with companies that, if possible, we should include an estimate of potential changes in business rates due to the revaluations in 2026 and 2029. This reduces the cashflow burden for companies in period and protects customers from larger adjustments at the end of the period. But we also recognise the challenge in forecasting changes in business rates in a robust way given the relatively large number of unknowns. That was why we did not reflect the revaluations due in 2026 and 2029 in our allowances at draft determinations.

We have updated our view of business rates allowances for final determinations. We incorporate a reasonable forecast of how business rates will change following planned revaluations in 2026 and 2029 based on known and forecastable changes. This reflects suggestions from companies in draft determination representations.

The Valuation Office Agency (VOA) values water networks using the receipts and expenditure method of valuation based on the regulated accounts which are produced for individual water companies. The valuation method works by taking receipts and deducting working expenses to give the annual profit.

Therefore, two significant factors at revaluations are companies' Regulatory Capital Value (RCV) and the weighted average cost of capital (WACC). The WACC has fallen at the last three price reviews and is rising at PR24. It is therefore reasonable to assume that rateable values, and consequently business rates, will increase at the next revaluation in 2026.

The 2026 revaluation will be based on conditions that could reasonably have been expected at 1 April 2024. Therefore, we have used our draft determinations RCV and wholesale WACC, and companies' own tenant's shares at the last revaluation to calculate a forecast rateable value for each company. For consistency, we have also used this approach for the 2029 revaluation.

Wastewater assets are valued differently. Sewage treatment works are valued by the Contractor's Basis method of valuation. Two of the major drivers that affect rateable values using this method are the cost of building the premises at the relevant valuation date and the statutory decapitalisation rate (the rate used to turn the capital sum into an annual equivalent). Sewers and accessories belonging to sewers are exempt from business rates.

For wastewater business rates we have used the provisional and forecast change in the Building Cost Information Service (BCIS) all in Tender Price Index between revaluations dates above inflation to forecast the rateable value on assets existing in 2024–25 at revaluations to calculate a change in the cost of building the assets. The 2026 revaluation will be based on economic conditions as at 1 April 2024 so we have used the provisional change in the index from quarter two of 2021 (used for the previous revaluation in 2023) to quarter two of 2024. We have assumed that the 2029 revaluation will be based on economic conditions as at 1 April 2027 we have used the forecast change in the index from quarter two of 2024 to quarter two of 2027. We have adjusted the change in index for inflation from 2022–23 (the base year for PR24).

We do not make an allowance for changes in wastewater asset stock in the period 2025–30. The impact on business rates of changes in assets is varied depending on the type of assets each company invests in so we cannot make a reasonable central estimate.

Not all companies forecast changes in business rates due to revaluations. However, we have applied our approach to all companies since we consider that the revaluations will apply to the whole sector.

We have continued to use the 2023–24 multiplier to calculate implied business rates liabilities since this is the multiplier set at the last revaluation and we have no way to forecast the multiplier at the next revaluations.

In its budget in October 2024,⁵¹ the Government announced its intention to permanently lower the business rates multipliers for high-street retail, hospitality and leisure properties.

⁵¹ HM Treasury, '[Autumn Budget 2024](#)', October 2024

This will be funded through a higher multiplier for the most valuable properties. It is unclear how this will impact water companies and the business rates that they pay compared to other sectors of the economy.

We consider that 10:10 cost sharing rates for business rates remain appropriate since we have made allowances for potential increases at revaluations. This approach provides companies with protection from changes in business rates. It also retains some incentive for companies to try and minimise any future increases to business rates. It also protects customers by giving money back to customers where the Valuation Office Agency reduces business rates, or business rates do not increase as much as we forecast at final determinations.

We do not consider that a notified Item for business rates is appropriate given we have included allowances for revaluations. We also do not agree that a business rates reconciliation should be added to our in-period determinations process. This would create bill volatility and additional complexity.

Our final determination

We allow £4.1 billion for business rates at final determinations, compared to £3.1 billion at draft determinations. We retain our draft determination position of 10:10 cost sharing rates for business rates.

2.3.2 Abstraction and discharge consent charges

What we said in our draft determinations

Water abstraction charges

The Environment Agency, Canal & River Trust and Natural Resources Wales impose abstraction charges on water companies to recover their costs of managing and regulating abstractions and discharge consents.

At draft determinations we allowed requested costs in full where they were consistent with existing abstraction charges. We made only very minor adjustments to allowances when uncertain 2023–24 costs were used to forecast costs over 2025–30.

Kielder reservoir and transfer scheme

Northumbrian Water forecasted an increase in abstraction charges due to forecast increases in the costs for water from the Kielder Transfer Scheme. In January 2024 the Environment Agency published a consultation on proposed changes to charges for Kielder reservoir and transfer scheme for 2024–25 to 2026–27.⁵¹ For draft determinations, we proposed to allow

Northumbrian Water's forecast abstraction charges in full. We stated that we would reconsider Northumbrian Water's charges at final determinations when the outcome of the consultation is known.

We also recognised that most of these abstraction charges are outside of Northumbrian Water's control, such as the return on investment and the recovery of the Environment Agency's own costs. Therefore, we allowed special sharing arrangements for Kielder reservoir abstraction charges. Northumbrian Water can recover 75% of any costs in excess of its PR24 cost allowance from its customers, or customers will recover 75% of the amount by which its costs are lower than PR24 allowances.

Wastewater discharge consents

In January 2024, the Environment Agency consulted on proposed changes to water quality permits charges. The changes proposed in the consultation could see water quality permit costs increase for wastewater companies. We said we would consider the outcome of this consultation and whether we should make a cost adjustment at final determinations.

Stakeholders' representations

Water abstraction charges

No company submitted representations on how we set allowances at draft determinations.

Four companies said that we should consider enhanced cost sharing rates for abstraction charges because the Environment Agency can change its charges at any time. Hafren Dyfrdwy and Severn Trent Water argue we should retain the 25:25 cost sharing rates we set at PR19. United Utilities and South West Water argue we should align the cost sharing rates with business rates at 10:10.

Kielder reservoir and transfer scheme

We received no representations on our draft determinations for Kielder Transfer Scheme abstraction charges.

Wastewater discharge consents

Seven companies submitted representations on the increase in Environment Agency water quality permit costs.

Anglian Water, United Utilities and Yorkshire Water suggested that these costs should be included in unmodelled costs for final determinations. Northumbrian Water, Severn Trent Water and Southern Water suggested that we should make an adjustment to modelled base costs for the additional costs.

South West Water considers that 25:25 cost sharing rates would be appropriate as there are risks of further changes in environmental regulation costs. Southern Water states that these costs should not have any cost sharing applied to them and should be fully trued-up at PR29.

Our assessment and reasons

We agree the increase in wastewater water quality permit costs represents a step change on those currently incurred and that this increase will not be reflected in the allowance from our base cost models.

For our PR24 final determinations, we assess wastewater discharge consent costs as part of unmodelled base costs. We have queried companies about changes in costs which were not explained in their representations.

We also agree there is some uncertainty about future environmental regulation and permit costs and therefore how much companies will pay in 2025–30. Due to the limited control companies have over the level of these charges we consider it appropriate to allow further protection for companies and customers with enhanced 25:25 cost sharing rates. This will allow companies to recover 75% of any costs in excess of PR24 cost allowances or allow customers to recover 75% of the amount by which costs are lower than PR24 allowances. We consider this provides companies with appropriate protection in respect of efficiently incurred costs, while retaining some incentive for companies to fully engage with the Environment Agency over changes in wastewater discharge consent charges.

Our final determination

Our final determinations allowances are £877 million for water abstraction charges and £560 million for wastewater discharge consents. We allow Northumbrian Water's forecast abstraction charges for Kielder Transfer Scheme in full as they are in line with the outcome of the Environment Agency's consultation.

We also apply enhanced cost sharing rate of 25:25 for both water and wastewater charges.

2.3.3 Traffic management act and lane rental scheme costs

What we said in our draft determinations

Traffic Management Act 2004

The Traffic Management Act (TMA) 2004 places a duty on local authorities to make sure traffic moves freely and quickly on their roads and the roads of nearby authorities. Water companies who want to carry out street works must apply to the local council for a permit.

Companies incur costs relating to the permits themselves as well as the administration of the permit schemes.

All companies except Hafren Dyfrdwy requested an allowance for TMA costs in their business plans. We proposed to allow £239.6 million compared to company submissions of £261.2 million. We applied the company specific modelled base efficiency factor (capped at 10%) to requested costs to reflect the fact that companies do have a degree of control over the duration of works associated with the TMA.

Lane rental schemes

Seven companies⁵² included costs associated with lane rental schemes in their business plan submissions totalling £17.3 million, of which we proposed to allow £12.9 million. Six out of the seven companies provided evidence detailing either ongoing lane rental schemes in their respective areas or the confirmed dates when charges would begin. For these companies we applied the company specific modelled base efficiency factor as we did for TMA costs.

United Utilities did not at that time incur lane rental scheme costs, and did not provide sufficient and convincing evidence to indicate their implementation. Therefore, we applied a 50% challenge to its forecast costs, to reduce the risk borne by customers should lane rental schemes fail to materialise.

Stakeholders' representations

Traffic Management Act 2004

No company submitted representations on how we set allowances at draft determinations.

Thames Water suggested enhanced cost sharing rates due to high uncertainty and limited management control.

Lane rental schemes

United Utilities accepted the 50% challenge we applied at draft determinations and reflected this in its representations. We received no other representations on how we set allowances at draft determinations.

South East Water included higher forecast lane rental scheme costs in its representations and Yorkshire Water included costs associated with lane rental schemes in their representations for the first time.

⁵² Southern Water, Thames Water, United Utilities, Affinity Water, Portsmouth Water, South East Water and South Staffs Water.

Severn Trent Water suggested applying a "universal uplift" for all companies due to the uncertain nature of where and when lane rental charges come into effect.

Yorkshire Water suggested applying a true-up to lane rental charges "as soon as possible after costs are incurred" as there exists the possibility that more council areas will introduce lane rental charges within the 2025-30 period.

Our assessment and reasons

We retain standard cost sharing rates for TMA and lane rental costs. This provides companies and customers with sufficient protection given these costs are relatively immaterial in the context of base expenditure allowances.

South East Water and Yorkshire Water have both provided sufficient and convincing evidence to provide an allowance for lane rental scheme costs. We accept their request subject to the company specific base cost efficiency challenge.

Our final determination

We allow £245.0 million for Traffic Management Act costs at final determinations, compared to £264.8 million in companies draft determination representations. This compares to an allowance of £239.6 million at draft determinations. The increase is due to companies increasing requested costs to take into account actual costs incurred in 2023-24.

We allow £23.2 million for lane rental scheme costs at final determinations, compared to £24.7 million in companies draft determination representations. This compares to an allowance of £12.9 million at draft determinations. The increase is due to new submissions by two companies and other companies increasing requested costs to take into account actual costs incurred in 2023-24.

We retain standard cost sharing rates for TMA and lane rental costs.

2.3.4 Wastewater Industrial Emissions Directive operating costs

What we said in our draft determinations

Six companies included the costs of Environment Agency and Natural Resources Wales permits and administration costs associated with the Industrial Emissions Directive in their business plans. We proposed to allow £7.0 million for these costs. This was equal to companies' business plan requests. We did not challenge these costs at draft determinations as they are mostly outside of company control and small relative to other unmodelled base cost areas. We said we would revisit at final determinations.

Stakeholders' representations

We did not receive any representations on how we determined the allowance for Industrial Emissions Directive permit costs at draft determination. United Utilities identified an error in our model where we had incorrectly excluded its allowance from the outputs.

Our final determination

We have not changed our approach for final determinations but have corrected the error in the model. We now allow £9.9 million for permits and administration costs associated with the Industrial Emissions Directive, compared to £7.0 million at draft determinations.

2.3.5 Third-party services

What we said in our draft determinations

In our draft determination we proposed an allowance of £593.5 million for third-party services costs, which was equal to what companies included in PR24 business plans. This includes price control and non-price control third-party services costs.

Third-party services costs are incurred by companies in providing services that use assets that are in some way bespoke for a particular group of customers. This includes non-potable supplies, rechargeable works, bulk supplies and excluded charges. Allowances were set equal to business plan requested costs as third-party services are self-financing so the corresponding revenues cover the projected costs.

Third-party services costs are excluded from cost sharing. But third-party costs are somewhat uncertain. If third-party costs are inside the price control then this can limit the ability of companies to recover additional costs if they are incurred, as revenues will be capped by the price control. We therefore proposed an end-of-period reconciliation to enable companies to recover efficient costs if outturn activity is different to forecast.

Stakeholders' representations

There were no significant issues raised with the general approach or with our models. Some companies increased the value of projected third party costs in their representations.

Our assessment and reasons

We have made minor changes to the model formulae to correct errors identified both by ourselves and in company representations.

Our final determination

We have allowed £667.0 million for third-party services costs, in line with company representations. This is more than 12% higher than our draft determinations.

2.3.6 Developer services and diversions (excluding network reinforcement)

What we said in our draft determinations

Developer services describes the activities delivered to connect new houses and businesses to the water and/or wastewater network. Developer services can be broken down into site-specific and network reinforcement work.

Site-specific work includes new connections; water mains and sewer requisitions; and diversions of an existing main, sewer or other apparatus under section 185 of the Water Industry Act 1991 (s185 diversions). Network reinforcement includes the provision or upgrading of network assets to supply new customers with no net deterioration of existing levels of service.

We focus on site-specific developer services and non-section 185 diversions here as we include network reinforcement as part of modelled base costs. Non-section 185 diversions are diversions requested under the New Roads and Street Works Act 1991 (NRSWA) and other diversions such as those required for High Speed 2.

We allowed £2.1 billion for developer services and diversions (excluding network reinforcement). This includes price control and non-price control costs.

The price control elements accounted for £0.9 billion of the total and are made up of:

- water site-specific developer services for Dŵr Cymru Welsh Water and Hafren Dyfrdwy;
- water section 185 diversions in England and Wales; and
- water and wastewater non-section 185 diversions in England and Wales.

For water service site specific developer services activities for Welsh water companies, we applied our company specific base cost efficiency challenge to companies' proposed costs to determine allowances. We capped the efficiency factor at 10% to reflect that it may be an imperfect indicator of the inefficiency of proposed developer services costs. Wastewater site specific developer services requested costs are allowed in full given the revenues are excluded from the price control.

We did not apply a cost efficiency challenge to company forecast costs for water section 185 diversions and water and wastewater non-section 185 diversions as the corresponding revenues should at least cover the projected costs. In addition, we included section 185 diversions (water only) and non-section 185 diversions (water and wastewater) in the third-

party services revenue reconciliation mechanism, which will protect customers by reconciling allowed revenue based on the difference between forecast and outturn revenues.

For non-section 185 diversions forecast under the NRSWA we assumed that companies will recover 82% of costs from the relevant authority because they may not be able to recover the full amount under the Act. So the remaining 18% will be funded by the generality of customers. We confirmed the third-party services cost reconciliation mechanism will cover all non-section 185 diversions costs.

Non-price control costs accounted for the remaining £1.2 billion and are made-up of:

- wastewater site-specific developer services (new connections, sewer requisitions, and section 185 sewer diversions) for companies operating in England and Wales as nearly all these services are delivered by developers; and
- water site-specific developer services (new connections and mains requisitions) for companies operating in England as there is relatively high levels of competition, which helps to protect the needs and interests of developer services customers along with our charging rules and competition law.

We accepted company proposed costs for all non-price control developer services activities given the revenues are excluded from the price control.

Stakeholders' representations

No significant issues were raised in stakeholder representations. Some companies increased the value of their projected developer services and diversions costs in their representations to account for updated growth forecasts.

Our assessment and reasons

We have made minor changes to the model formulae to correct errors identified both by ourselves and in company representations.

Our final determination

We allow £2.3 billion for developer services and diversions (excluding network reinforcement). This is an increase of around £180 million or 8% compared with our draft determination. It is reflective of the increased forecast which companies included in their representations with companies citing forecast increased housebuilding and business activity following the general election. The price control element is £0.9 billion and non-price control £1.4 billion.

2.3.7 Non household retail (Dŵr Cymru and Hafren Dyfrdwy)

What we said in our draft determinations

For non-household retail, we set an average revenue control for retail costs faced by water companies operating mainly in Wales that serve business customers. The average revenue control sets default tariff caps based on allowed average cost per customer and net/gross margins.

In our draft determinations, we set an allowed average cost per customer for water and wastewater customers in the non-contestable segments of the Welsh business retail market. The non-contestable segment is defined as customers using less than 50 megalitres of water per year, and all wastewater customers.

In our draft determinations, we proposed to allow £30.6 million before the application of frontier shift and real price effects for non-household retail costs, and £29.5 million after applying a 1% frontier shift challenge and a labour real price effect (RPE).

Stakeholders' representations

We did not receive material feedback on our approach to assessing non-household retail costs.

Through the PR24 query process, Dŵr Cymru highlighted that the tariff band costs used in our assessment were reported in post frontier shift and RPEs terms by companies. These costs were restated in pre-frontier shift and RPE terms in both Dŵr Cymru and Hafren Dyfrdwy representations. Hafren Dyfrdwy also restated its tariff band cost data.

Our assessment and reasons

Having considered stakeholder responses, we have retained our draft determination approach to assessing non-household retail costs at final determination. We used companies restated tariff band cost data in our assessment, which has led to minor changes in allowances.

Our final determination

We allow £30.7 million for non-household retail costs before frontier shift efficiency and RPEs, which is equal to the companies' requested costs. We allow £29.8 million after applying a 1% frontier shift challenge and a labour real price effect (RPE). We apply the same frontier shift and RPE assumptions to non-household and residential retail costs, as detailed in section 4.

The table below presents the allowed average retail cost per customer for customers using less than 50ML of water or wastewater services per year.

Table 11: Allowed average retail cost per customer (£, nominal prices)

Company	Customer	2025-26	2026-27	2027-28	2028-29	2029-30
Dŵr Cymru	Water supplies < 50Ml	37.74	36.24	35.87	35.49	35.55
	Wastewater services	38.21	36.71	36.36	35.99	36.05
Hafren Dyfrdwy	Water supplies < 50Ml	51.38	51.19	51.25	47.58	46.19
	Wastewater services	61.20	58.70	58.93	56.01	52.86

2.3.8 Pension deficit recovery payments

What we said in our draft determinations

Historically, all companies have operated defined benefit pension schemes for their employees. In recent times, the estimates of scheme liabilities have exceeded estimates of assets, giving rise to deficits. The deficits are repaired by additional contributions or deficit repair costs. These costs are separate from ongoing pension contributions, which are included in modelled base costs.

We followed the approach set out in our information notice '[IN 13/17: Treatment of companies](#)' pension deficit repair costs at the 2014 price review (October 2013) to make an allowance for pension deficit recovery payments.

In 2009, we set a pension deficit recovery period for each company and companies were allowed to recover 50% of deficits from customers. Information Notice 13/17 shows the assumed recovery periods and sets out our policy for the treatment of pension deficit repair costs at PR14 and beyond. For one company, Northumbrian Water, the recovery period extends to 2025-30. We proposed to allow £43.7 million for Northumbrian Water's remaining recovery period in line with Information Notice 13/17 at PR24. This allowance is excluded from our view of efficient base expenditure allowances presented in this paper but is included in the financial model.

Thames Water included £156.6 million for pension deficit repair costs in its business plan. In line with Information Notice 13/17, remaining pension deficits fall wholly to management and shareholders to deal with. We therefore proposed to not allow Thames Water additional pension deficit repair costs.

Stakeholders' representations

We did not receive any representations on our approach to assessing pension deficit repair costs.

Our final determination

We have retained our draft determination approach for final determinations.

We continue to allow £43.7 million for Northumbrian Water in line with Information Notice 13/17. This allowance is excluded from our view of efficient base expenditure allowances presented in this paper but is included in the financial model.

2.3.9 Equity issuance costs

In our PR24 methodology we said we would provide companies with an allowance for equity issuance costs in the case of significant regulated capital value (RCV) growth.

We allow £318 million for equity issuance costs, representing 2.5% of new equity. This is an increase from £71.8 million at draft determinations as a result of increasing the cost allowance from 2% to 2.5% of new equity following consideration of stakeholder representations and an increase in equity issued. This has been added to operating costs in the financial model and funded through PAYG allowances. We discuss our approach to equity issuance and our consideration of stakeholder representations in 'PR24 final determinations: Aligning risk and return – Risk and return appendix'.

The table below presents equity issuance cost allowances for final determinations, which reflect the different amounts of equity each company needs to raise.⁵³

Figure 7: equity issuance cost allowances for PR24 final determinations

Company	Final determinations, 2025-30 (£m, 2022-23 prices)
Anglian Water	38.08
Dŵr Cymru	19.90
Hafren Dyfrdwy	0.64
Northumbrian Water	21.79
Severn Trent Water	46.57
South West Water	9.53
Southern Water	30.65
Thames Water	70.00
United Utilities	29.28
Wessex Water	12.80

⁵³ Please note these costs are not included in the base and total expenditure allowance figures presented in this document, but they are included in each company's financial model and reflected in allowed revenue.

Company	Final determinations, 2025-30 (£m, 2022-23 prices)
Yorkshire Water	26.64
Affinity Water	3.80
Portsmouth Water	2.80
South East Water	3.30
South Staffs Water	1.11
SES Water	0.68

2.4 Improving asset health in the water sector

What we said in our draft determination

Since 2011-12, capital maintenance expenditure has increased in real terms by 9% and companies performance against asset health performance commitments has improved. In our draft determination, base expenditure allowances were 14% higher than at PR19, and 3% more than companies have spent in the last five years on average. We stated that we expect companies to use this increase in expenditure to maintain and improve the health of their asset base and to deliver improved asset health taking into account the impact of climate change in the 2025-30 period.

Our draft determination sought to better understand asset condition problems faced by water companies. Alongside company business plans, we assessed over ten cost adjustment claims relating to a step change in capital maintenance requirements to maintain or improve asset health and/or condition. We also collected and assessed asset condition data for water distribution mains, sewers and bioresources assets.

Our preferred approach at draft determination was to apply sector wide adjustments. These adjustments sought to target asset condition issues that were impacting several or all companies. Our assessment was underpinned by robust and comparable data that allowed us to assess all companies equally. This avoided applying an adjustment to any single company that has poor asset condition because of poor asset management, which could drive perverse incentives (ie not delivering asset renewals with base expenditure allowances) and lead to customers paying twice for asset renewals. Water companies have a duty to maintain an efficient and economical system of water supply, including maintaining good asset health.⁵⁴

We proposed two sector wide adjustments for mains renewals and meter replacements over the 2025-30 period, as discussed above. These aimed to improve water mains condition and

⁵⁴ UK Government, Section 37, [Water Industry Act 1991](#).

move towards a more sustainable mains renewal rate, and facilitate delivery of the smart meter enhancement programme.

We were unable to assess the need of sector wide cost adjustments for other asset classes (eg treatment works, pumping stations and service reservoirs) due to the absence of reliable asset condition and workload (ie renewals and refurbishments) data for all companies. For these assets, we relied upon evidence submitted by companies in their business plans. The evidence provided did not suggest there was other sector wide asset condition issues that need addressing in the short term. We also rejected two cost adjustment claims from Northumbrian Water and Yorkshire Water that proposed an increase in capital maintenance expenditure related to their non-infrastructure assets. We rejected these claims as they failed to provide compelling evidence to demonstrate unique circumstances, efficient investment of historical base allowances, and identify outputs of investment could be tied to a price control deliverable.

We also assessed whether any of the PR24 frontier companies have experienced a capital maintenance trough in the last five years, and therefore impacted the level of stretch imposed through our catch-up efficiency challenge. This analysis was also carried out by the Competition and Markets Authority at PR19 under the same approach. In our draft determination, we drew the conclusion that there was no clear evidence that the companies that help to set the benchmark are in a capital maintenance trough. We also found no evidence to suggest that cost efficient companies perform poorly on outcomes.

Stakeholder representations

Water companies supported our draft determination proposal to apply sector wide adjustments to mains renewals and meter replacements. Company responses acknowledge the steps taken at PR24 to address some of the issues water companies are expected to face over the 2025–30 period and expressed support for our methodological approach to applying these adjustments.

Four water companies expressed disagreement with our draft determination approach to assessing asset health more broadly.⁵⁵ Their responses raised the following points:

- The companies stated that deterioration in asset condition since PR09 is a consequence of historical base underfunding, and the need for companies to divert spend to higher impact areas to meet performance commitments.

⁵⁵ Northumbrian Water, Southern Water, Yorkshire Water and Wessex Water. All four of these companies submitted cost adjustment claims relating to an increase in capital maintenance expenditure over the 2025–30 period.

- The companies stated that the historical costs used in our econometric models to set base allowances are not reflective of future requirements. They state this is likely to lead to insufficient base expenditure allowances at PR24.
- The companies consider that our sector wide adjustments should be applied to a wider set of assets.
- Northumbrian Water and Yorkshire Water disagreed that further adjustments to allowances would lead to customers paying twice at PR24. The companies stated that they are spending their allowances in full which means that customers will not pay twice.
- Northumbrian Water states that rejecting capital maintenance related cost adjustment claims at PR24 will disincentivise the sector from submitting these in future.

Anglian Water shared some of the above concerns. In particular, that future asset replacement needs to be significantly higher than in the past. But the company stated that it sees our draft determination as a step in the right direction, and would like us to take a holistic approach to assessing asset health by working with our Asset Management and Operational Resilience (AMOR) team. In addition, it suggested that we continue to build on the Asset Management Maturity Assessment (AMMA) and that our assessment of company requests should place weight on AMMA scores to incentivise companies to invest in good asset management practice.

Water UK commissioned a report from Reckon to respond to our approach to assessing asset health in our PR24 draft determinations. This report was supported by four water companies.⁵⁶ Reckon states that the focus of its work looks forward to PR29, but nevertheless sets out a range of potential options for improving asset health at PR24. The report suggests considering the following options:

- Retaining our base cost benchmarking models, with an improved process for funding additional investment in asset health beyond that implicitly funded by the models. Reckon acknowledges the steps we have taken at PR24 to address some asset condition issues. It recommends considering extending the set of companies whom additional funding for mains replacement is provided. Or applying a similar approach to other areas of asset replacement beyond water mains.
- Retaining our base cost benchmarking models, supported by forward-looking industry wide adjustments and enhanced incentives on long-term performance. Reckon recommend providing an uplift to allow for the difference between the likely level of efficient costs and our view of allowances in the next period. Reckon propose flexible investment for companies that is not limited to specific areas of investment or conditional on PCDs.

⁵⁶ Affinity Water, Anglian Water, Northumbrian Water and Wessex Water.

- Retaining our base cost benchmarking models, supported by a use-it-or-lose-it allowance that focuses on capital maintenance expenditure.

Other stakeholders, including CCW, supported our decision to apply adjustments to allowances that would improve the condition of the network. But expressed their preference to hold companies to account through a PCD.

Anglian Water states our conclusion that there is no capital maintenance trough is incorrect. The company states that our analysis does not look back far enough in time, and suggests that the first capital maintenance trough was in 2008 when botex models were introduced. The company states that the companies setting the benchmark have materially reduced renewal rates over the period considered. It also presents analysis to show that increases in capital maintenance expenditure has not kept pace with Regulatory Capital Value (RCV) growth. Northumbrian Water and Wessex Water also shared this view.

Wessex Water states that analysis of capital maintenance expenditure may be unreflective of requirements outside of that specific time period. It also states that this may not be reflective of companies' actual requirements, only what they have been able to spend.

Our assessment and reasons

We set base expenditure allowances that companies should invest to maintain good asset health. Capital maintenance within base expenditure allowances has increased materially since privatisation. And asset health metrics (eg mains repairs; unplanned outage; sewer collapses) show a stable or improving trend over time. We expect companies to continue to maintain and improve asset health from base expenditure allowances going forward.

We are concerned that water companies have not delivered sufficient asset renewals to keep up with deterioration over the long-term. For example, companies forecast to renew water mains at an average rate of 0.4 percent per year in their PR19 business plans. This was consistent with our view of what base buys at PR19, and therefore what companies were able to deliver with their base allowances. But during the period, renewals have been carried out at a rate of just 0.1 percent.

We have sought to better understand asset condition issues faced by the sector at PR24. We have provided additional allowances where evidence suggests that companies need to deliver more asset renewals and refurbishment than they have delivered historically to maintain and improve asset condition. At the same time, we have made sure that customers do not pay twice for capital maintenance that companies should have delivered with base expenditure allowances in the past. Our assessment has been informed by collecting comparable and robust asset condition and renewals / refurbishment data from companies on water mains, sewers and bioresources assets, and evidence provided by companies in business plans and cost adjustment claims.

We have allowed four cost adjustment claims to companies that demonstrated they face unique circumstances that mean they will face relatively higher capital maintenance requirements than other companies over the 2025-30 period.⁵⁷

Having considered stakeholders feedback, we maintain our approach to provide sector wide cost adjustments to address asset condition issues. This ensures that our decisions are underpinned by robust data and all companies are assessed equally. This approach avoids applying an adjustment to any one single company that demonstrates a deterioration in asset health and/or condition. It also reduces the risk of allowing cost adjustments as a result of historical underinvestment and asset deterioration, which ensures that customers do not pay twice for asset renewals.

At final determinations, we apply two capital maintenance sector wide cost adjustments to allow companies to renew more water mains and meters than they are funded to deliver through the base cost models. These total £1.2 billion. The water mains cost adjustment will move the sector towards a more sustainable mains renewals rate over the 2025-30 period. And the meter replacement cost adjustment helps to facilitate the roll out of smart meters.

For sewage pumping mains (ie rising mains), renewal rates have remained stable over time (unlike water mains) and asset condition appears good for most companies. So, we do not consider a sector wide cost adjustment is needed. But we will hold companies to account for rising mains renewals that should be delivered with base expenditure allowances through a combination of transparency in reporting and price control deliverables. The latter applies to Dŵr Cymru and United Utilities. Both companies have renewed rising mains significantly below the average rate historically and have allowed their assets to deteriorate since PR09.⁵⁸ We also did not identify a sector wide asset condition problem for bioresources and gravity sewers that needs addressing through a sector wide cost adjustment.

We received four additional forward-looking capital maintenance cost adjustment claims from Northumbrian Water, Yorkshire Water, Wessex Water and Southern Water that requested a step-up in capital maintenance over the 2025-30 period that they do not think are reflected in base expenditure allowances. These largely focused on non-infra assets (eg treatment works, service reservoirs, pumping stations), which we do not currently have reliable asset condition and workload (ie renewals and refurbishment) data on for all companies. We do not allow these cost adjustments because of three main reasons:

- The companies do not present any company specific issues that underpin the claims or can point to any other factors outside of company control that means future capital maintenance requirements will be higher than in the past. As a result, the step change in

⁵⁷ Hafren Dyfrdwy (reservoir maintenance and Wrexham ring main), SES Water (statutory water softening), and Thames Water (Beckton sludge powered generator replacement - included in large scheme gated process).

⁵⁸ Dŵr Cymru is also being held to account for delivery of its habitat restoration SECs enhancement scheme.

capital maintenance may be for asset renewals and refurbishment that these companies should have delivered with base expenditure allowances in previous regulatory periods.

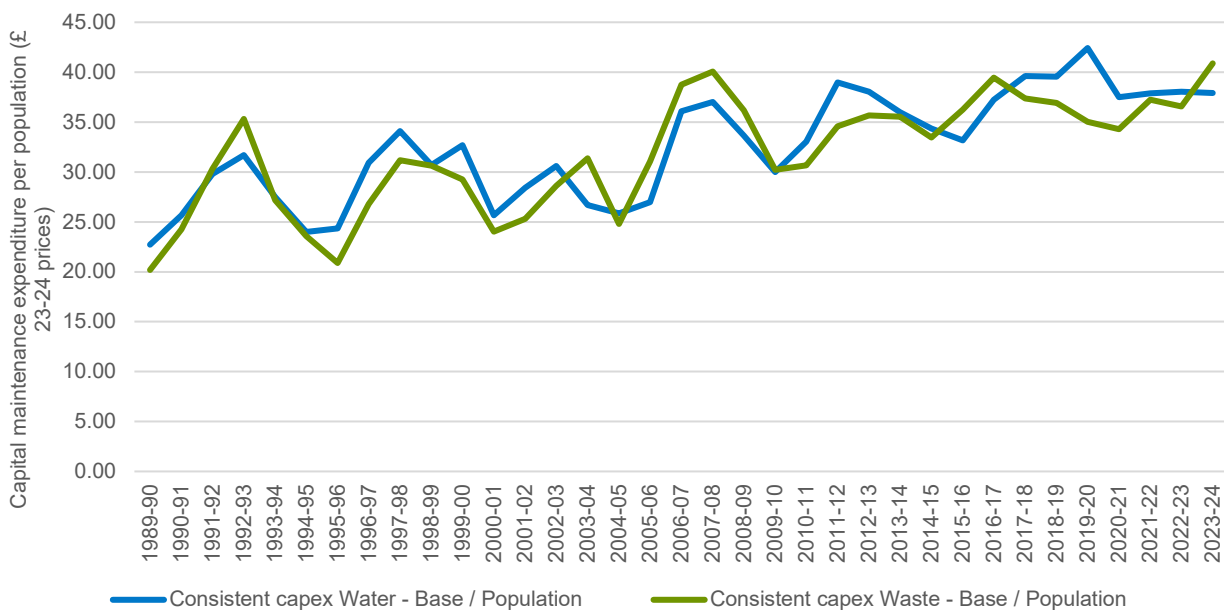
- The outputs from the proposed cost adjustment claims are unclear. This means it would be difficult if not impossible to hold the companies to account for delivery of additional outputs or improvements in asset health outcomes.
- It could disincentivise companies from undertaking asset renewals with base expenditure allowances going forward.

We have developed a plan for the next five years (2025–30) alongside the Asset Management and Operational Resilience (AMOR) team that works towards gaining greater insight into the condition of a wider range of assets ahead of PR29. We discuss this further below. We will use insights from this analysis to consider further sector wide base cost adjustments at PR29 to address asset condition issues. We will also assess if there are any sector wide asset condition issues that need to, and can be, addressed ahead of the next price review period (PR29). For example, through additional base expenditure allowances in-period or at the PR24 end-of-period reconciliation, or allow companies to accelerate 2025–30 capital maintenance spend into the last two to three years of the 2025–30 period.

We provide our assessment of stakeholder responses in detail below.

We do not agree that base expenditure allowances have not been enough to prevent deterioration in asset condition

Capital maintenance within base expenditure allowances has increased by 3% per year in real terms (ie after adjusting for general inflation) since privatisation. Capital maintenance has also increased over time on a per capita basis (ie after accounting for increases in population over time). This is shown in the figures below.

Figure 8: Capital maintenance expenditure⁵⁹**Figure 9: Capital maintenance per population⁶⁰**

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.^{61 62}

⁵⁹ Source: <https://www.ofwat.gov.uk/publication/long-term-data-series-of-company-costs/>

⁶⁰ Source: <https://www.ofwat.gov.uk/publication/long-term-data-series-of-company-costs/>

⁶¹ [PR19-final-determinations-Securing-cost-efficiency-technical-appendix.pdf](#), Table A1.2.

⁶² [det_pr20141212wholesale.pdf](#)

This evidence does not support the view that we have applied overly stretching cost efficiency challenges and prioritised keeping water bills low at previous price reviews.

Companies are overspending their PR19 base expenditure allowances at a sector level. This has been primarily driven by energy costs and supply chain cost increases. During this time, capital maintenance expenditure has remained constant or has grown at a steady rate that is consistent with earlier years. This indicates that overspend is not due to an increase in capital maintenance requirements in recent years, but rather unforeseen cost pressures that water companies have rediverted spend to address. We therefore disagree with the view that companies are not sufficiently funded to maintain asset health.

Figure 10: Wholesale water capital maintenance expenditure and power costs

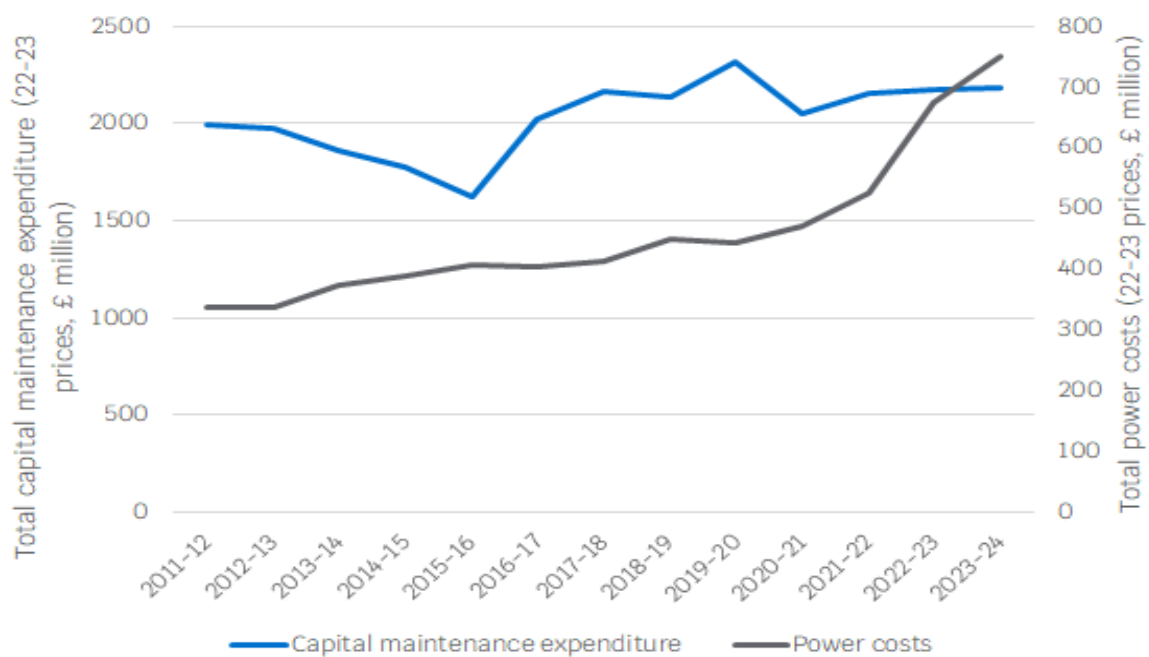
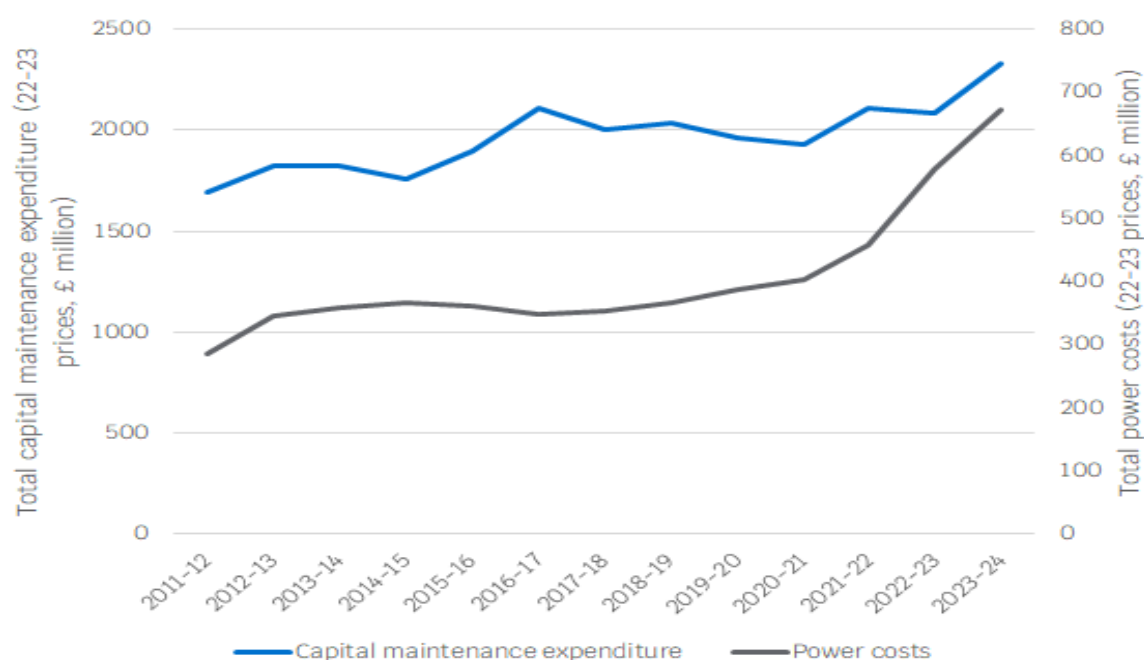


Figure 11: Wholesale wastewater capital maintenance expenditure and power costs

At draft determinations we presented analysis to show that the companies that set the catch-up efficiency benchmark are not in a capital maintenance trough. This mitigates the risk that the catch-up efficiency benchmark leads to base expenditure allowances that are not sufficient to maintain good asset health. Anglian Water challenged our analysis at draft determinations. The company states that our analysis is flawed as it believes the capital maintenance trough started around 2008 and this is not reflected in our analysis. It also states that the benchmark companies have reduced renewal rates in recent years.

We disagree with Anglian Water's conclusions. As shown above, capital maintenance spend has increased in real terms over time across the sector, so we disagree that the capital maintenance trough started around 2008. Our draft determination analysis aimed to determine if our catch-up efficiency challenge leads to an efficiency challenge that is too stretching due to the benchmark companies being in a capital maintenance trough over the last 5-year period. Our analysis indicated this is not the case. The CMA also made the same conclusion in the PR19 redeterminations.

We also note that the upper quartile catch-up efficiency adjustment based on the last 5-years of outturn data is relatively small, and is supported by all companies. It is unclear if Anglian Water are encouraging us to look at across the full historical sample period when determining the catch-up efficiency challenge (ie 2011-12 onwards). But taking this approach would lead to a more stretching cost efficiency challenge given our current approach helps to capture higher input price pressures faced by companies in recent years.

Anglian Water's analysis to show that the benchmark companies have reduced renewal rates only focuses on water mains renewals. As discussed earlier in section 2, this is a sector wide

issue, rather than specifically for the benchmark companies, which we have addressed through our sector wide mains cost adjustment. We disagree with drawing conclusions on renewal rates for other asset types based on this data, particularly when capital maintenance spend continues to increase in real terms. We will gather additional data on asset renewals and refurbishments from companies ahead of PR29 (discussed further below).

Several companies also commented that they have maintained asset condition with base expenditure allowances in PR24 query responses. For example, Severn Trent Water commented that although the data may indicate a deterioration in condition for some assets, it has maintained its assets over time. United Utilities also commented that it has maintained stable asset performance and condition over time. Query responses also demonstrated that companies have delivered large civil asset renewals with base expenditure allowances, but some companies appear to have been more proactive in renewing assets than others.

Our analysis shows that asset condition has largely been maintained or improved since PR09 across water mains, gravity sewers, rising mains and bioresources assets

We collected robust and comparable asset condition data on water mains, gravity sewers, rising mains and bioresources assets through the PR24 process.

We are able to compare asset condition now with asset condition in PR09 for water distribution mains, sewage pumping mains, and bioresources assets to assess if asset condition has been maintained over time. These comparisons are presented in the figures below. Overall, our analysis suggests that base expenditure allowances have been sufficient to maintain and even improve asset condition. For example, the percentage of water mains in condition grade 4 (poor) and 5 (very poor) have decreased from 6.3% to 4.3%.

It is more challenging to compare gravity sewer condition on a like-for-like basis with PR09 sewer condition data due to differences in reporting requirements. At PR24, we updated the methodology for gravity sewer condition assessment so that the grading is based on numbers of sewer collapses reported in the annual performance report. This more closely aligns with the methodology for sewage pumping mains and water distribution mains. It also enables robust comparisons between companies. In contrast, the PR09 gravity sewer condition assessment was based on closed circuit television survey data, which did not aid comparisons between companies very easily. Overall, gravity sewers appear to be in a reasonable condition despite being unable to compare against asset condition at PR09.

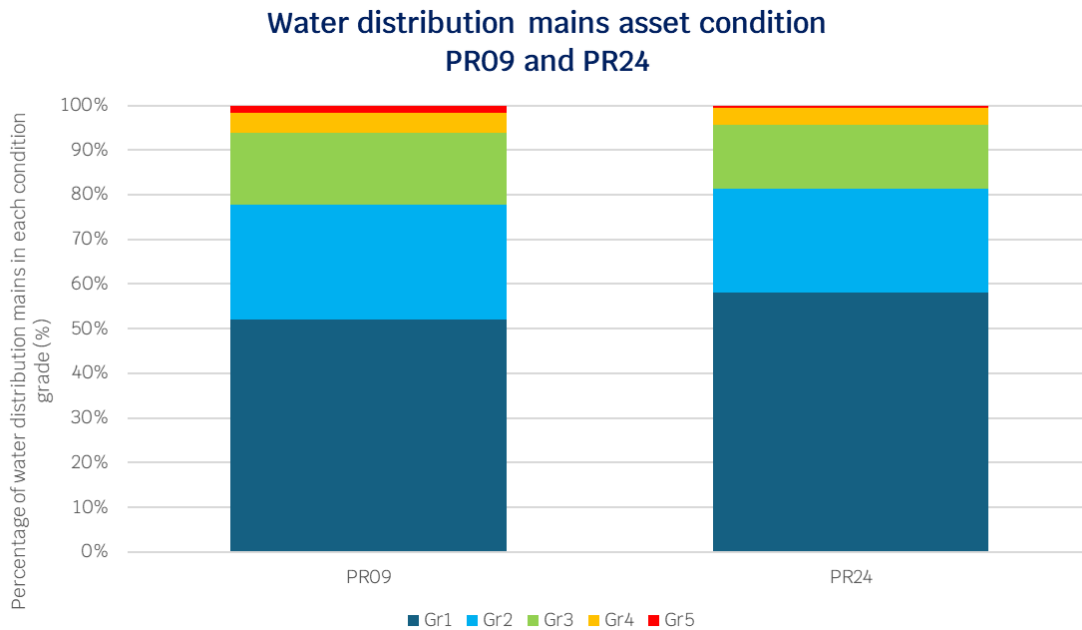
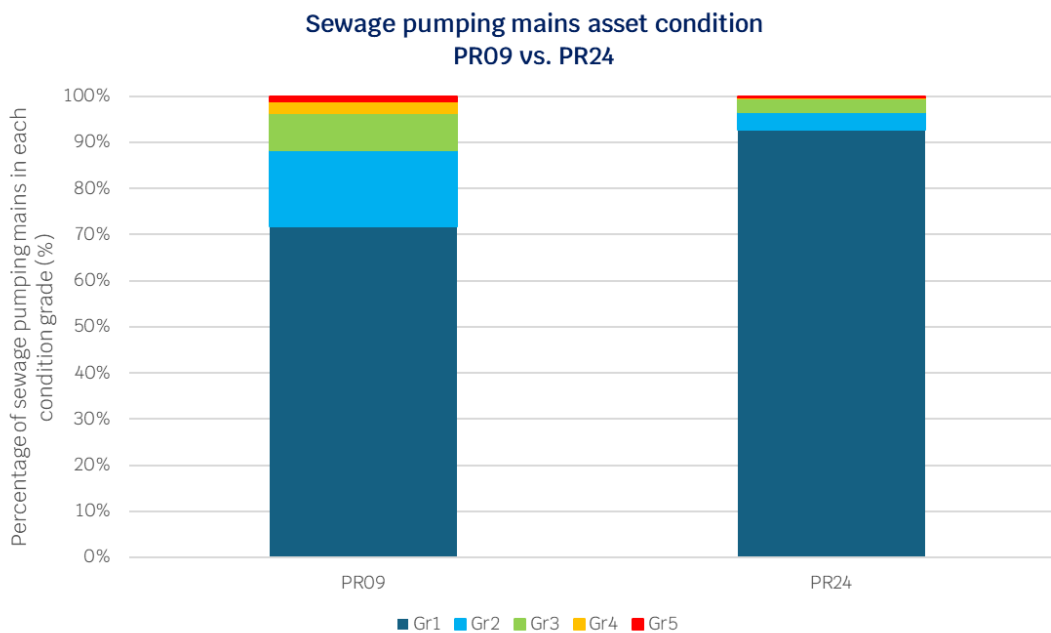
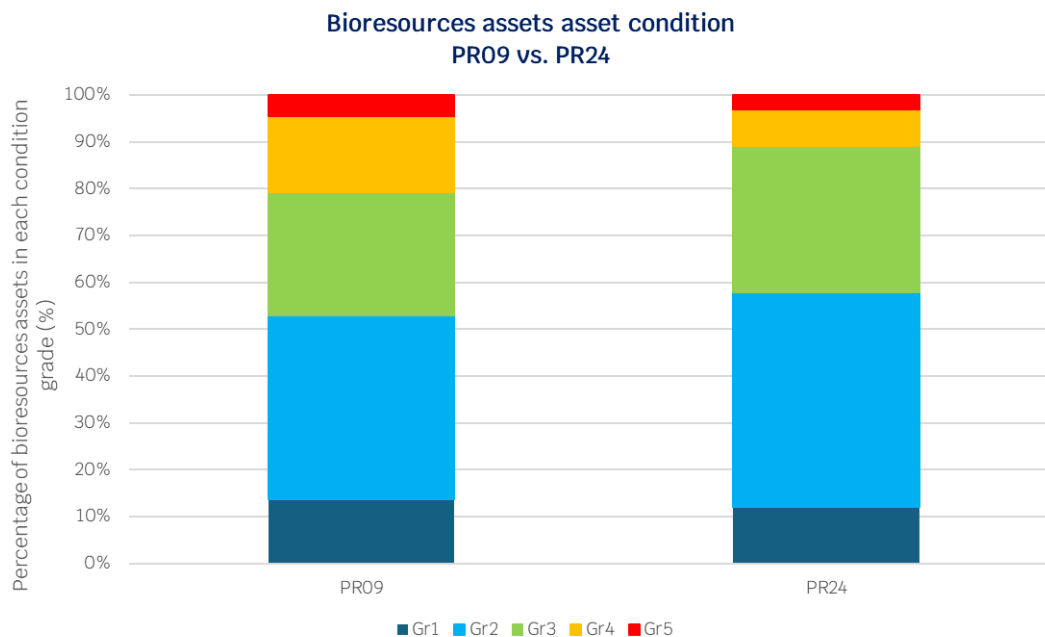
Figure 12: Water distribution mains asset condition, PR09 vs. PR24**Figure 13: Sewage pumping mains asset condition, PR09 vs. PR24**

Figure 14: Bioresources assets asset condition, PR09 vs. PR24

Customers must not pay twice for asset renewals and refurbishment

Some companies comment that customers will not pay twice for capital maintenance because they have spent their allowances in full. We strongly disagree. Comparing spend versus allowances is not enough to make this conclusion. Companies have a duty to maintain an efficient and economical system of water supply, including maintaining good asset health. Companies must deliver sufficient asset renewals and refurbishments with base expenditure allowances to maintain long-term capability of assets. We expect companies to propose an appropriate amount of asset renewals and refurbishment in their business plan submissions to achieve this, and to deliver on their business plan proposals. Evidence presented in business plans suggests that some companies may not have maintained their assets as expected. Spending allowances in full and choosing where to direct this spend is within management control. However, when investing the company should maintain its duty to customers to maintain good asset health. If it fails to do so, customers should not pay twice for these choices.

Companies have rightly highlighted the importance of maintaining good asset health in responses to our draft determinations. So, we do not expect companies to defer or under-deliver on asset renewals and refurbishment if unexpected cost pressures occur elsewhere in the business that companies did not reflect in their business plans. Cost sharing and other uncertainty mechanisms are in place to mitigate the risk of companies facing costs they did not expect to incur. Cost sharing also helps companies to balance peaks and troughs in capital maintenance over time with their long-term base allowance, by overspending in some periods (ie in a peak) and underspending in other periods (ie in a trough).

Nevertheless, we have compared spend versus total expenditure allowances from PR99 to PR19, building on the analysis completed for the [PR14 review](#). Our analysis shows that there has been a mix of under- and over-spend across companies, which may reflect differences in cost efficiency and companies being at different points on the capital maintenance cycle. PR19 is the exception with companies overspending allowances due to a range of factors, including higher than expected input prices, investment to improve asset health, and expenditure to improve performance. For avoidance of doubt, water companies should not under-deliver on capital maintenance in the event of higher than expected input prices.

It is not feasible to expand sector wide capital maintenance cost adjustments to a wider set of assets at PR24 due to the absence of robust asset condition and workload data

Information asymmetry is one of the main issues we face when assessing capital maintenance cost adjustment claims. We do not collect expenditure or workload (ie refurbishment/replacement) data relating to every asset type through our Annual Performance Reports (APRs).⁶³ In addition, we do not collect asset condition data for all assets. This poses some difficulty when assessing what companies have delivered historically through base allowances, and consequently what base buys going forwards. As well as identifying whether there is a sector wide asset condition issue that needs to be addressed.

To help better understand some of the concerns raised in stakeholder feedback around wider asset condition issues, we issued a query to all companies that asked them to report any readily available condition grade data for a range of water and wastewater assets. We asked companies to submit what data was available, and to state any assumptions underpinning this. In addition, we also asked companies to submit capital maintenance expenditure (by asset type) and workload data for the 2019-20 to 2023-24 period.

Most companies were able to respond to our requests for at least some assets. Although the data was heavily caveated, and several companies raised concerns about comparability over time and between companies. Despite this, most companies responded positively to our request and welcomed an open conversation about our findings.

The data was provided by companies in a short timeframe and is strongly caveated, particularly over its comparability with PR09 data. It is unlikely to be assured, and in many cases is based on a best endeavours approach. It also does not cover all assets and companies. We therefore decided not to draw any firm conclusions or provide further cost adjustments based on this data at final determinations. Nonetheless, at a high level, the data did not indicate a prominent sector wide asset condition issue for other asset types that

⁶³ We previously collected more of this through June Returns reporting. We moved away from this approach based on companies recommendations from the Gray Review. The review stated that "it needs to reduce the burden of regulation on the companies to encourage them to be more flexible and innovative in their approach." [\[ARCHIVED CONTENT\]](#), page 5.

needs to be addressed with additional expenditure allowances at PR24. But did indicate that there may be some company specific asset condition issues across different asset types.

We have developed a plan for the 2025–30 period with our Asset Management and Operational Resilience team (AMOR) that aims to collect asset condition and workload (ie renewals and refurbishments) data on a consistent basis between companies. We set this out further below. This aims to provide a clearer picture on the state of asset condition in the water sector ahead of PR29.

It is not appropriate to provide a 'use-it-or-lose-it' capital maintenance allowance

On behalf of Water UK, Reckon suggest that we consider the option of moving to a 'use-it-or-lose-it' capital maintenance allowance in our final determination. This would mean providing companies with an additional allowance that can be invested flexibly to deliver improvements in asset health. This approach is also supported by Anglian Water and Northumbrian Water in their responses.

We do not consider it is appropriate to provide a 'use-it-or-lose it' capital maintenance allowance for several reasons.

It would be inappropriate to give companies additional allowances just because they have not been maintaining assets appropriately. This 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) when companies should maintain an efficient and economical system of water supply with base expenditure allowances. It would also reduce incentives to maintain good asset health with base expenditure allowances in the future.

It would also be challenging to determine what the 'use-it-or-lose-it' allowance would be for each company 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.

Finally, it is unclear whether there is sector wide support for a change in our approach to assessing base expenditure allowances. Only a small subset of companies have discussed this issue in draft determination representations, and the Water UK report is only supported by four water companies. We are looking to engage with the sector on how to better understand asset condition ahead of PR29, which we discuss below.

Our plan to improve understanding of asset condition by PR29

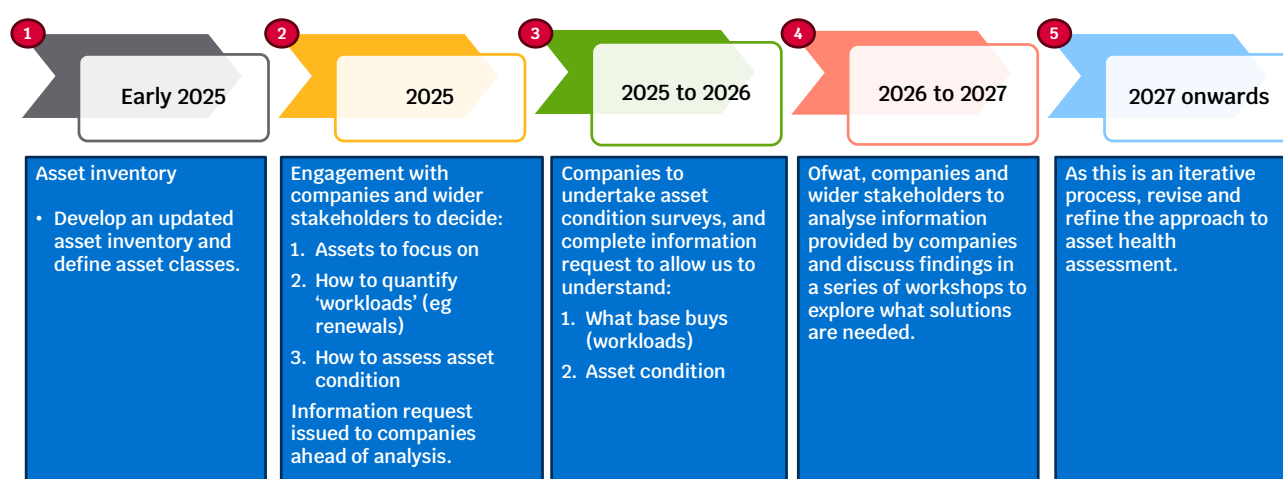
Assessing capital maintenance cost adjustment claims is challenging. The challenge stems from the lack of available robust asset condition and asset workload data that is comparable

across companies and time, which enable us to understand what companies should already deliver with base expenditure allowances so that customers do not pay twice. We have overcome some of these challenges at PR24 for water mains, sewers and bioresources assets. But not for other assets such as treatment works and service reservoirs. We intend to collect asset condition and workload data across a wide range of assets maintained by water and wastewater companies ahead of PR29.

We have developed a plan for the 2025–30 period that will help us to gain greater insight about asset condition in the water sector, and whether companies are delivering the right interventions to manage asset deterioration. Asset condition is a critical part of our ongoing Operational Resilience Working Group work. While asset condition is just one part of the asset health picture, it will form an important part of our integrated monitoring framework, which will develop insights across all four areas of operational resilience (reliability, resistance, redundancy, recovery) into a range of performance characteristics of different assets and systems. Our 2025–30 plan will align with the ongoing engagement with the sector through our Operational Resilience Working Group (ORWG), and will help us make progress towards developing a more complete view of asset health in the water sector. It will also provide the information needed to make robust decisions on whether further sector wide base cost adjustments are needed to allow water companies to maintain asset health as part of PR29.

Our short term plan focuses on the 2025 to 2027 period, and involves extensive engagement with the sector. We have identified key deliverables across the period, which will see us work with the sector to develop an asset inventory, define key assets and capital maintenance interventions, before moving to asset condition surveys and analysis of data to determine what base buys.

Figure 15: Plan to better understand asset condition in the water sector



Over the two year period, we intend to work collaboratively with the sector to identify priority assets to focus on in the short term. For example, these assets may be those that companies consider more high risk and prone to failure. We will then work through the mapped milestones with the sector to deliver key deliverables by 2027.

Our aim is to produce a sector wide robust asset condition and workload dataset for the 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 (eg additional sector wide capital maintenance cost adjustments).⁶⁴

We will also assess if there are any sector wide asset condition issues that need to, and can be, addressed before the next price review period (PR29). We will work with the sector to find the most appropriate solution to address any issues identified. Options we are open to considering are:

- Provide additional base expenditure allowances either in-period or through the PR24 end-of-period reconciliation if any sector wide asset condition issues identified are material and can be resolved by 31st March 2030. We recognise this may not be appropriate for large civil works that tend to have a lead time of around 2-3 years.
- Allow companies to accelerate 2030-35 capital maintenance spend into the last two to three years of the 2025-30 period (2027-28, 2028-29 and 2029-30). We believe think this option is likely to be the most appropriate for most asset classes given the time required to plan and deliver work.

We will only consider providing additional allowances for asset renewals and refurbishment that is above and beyond what companies should be delivering with PR24 base expenditure allowances (ie what base buys). We will also take into account any under-delivery of capital maintenance in previous periods. Particularly if companies have allowed asset condition to deteriorate over time. This avoids customers paying twice for capital maintenance works.

To demonstrate the need for additional or accelerated capital maintenance expenditure allowances, we would also expect companies to provide the following evidence:

- Demonstrate the asset condition issue is not limited to a single or small number of companies, unless caused by unique company specific factors that are outside of company control.
- Evidence that PR24 base expenditure allowances are exhausted and have been invested efficiently to deliver outcomes for customers and the environment.
- Demonstrate efficient investment of historical base expenditure allowances.
- Demonstrate that the asset condition issue is the result of factors that are outside of company control, rather than poor asset management.

⁶⁴ We will make this dataset available to water companies and stakeholders ahead of workshops so that they can conduct their own analysis.

We are committed to delivering our plan in a timely manner, and engaging with the sector to deliver insights about asset condition in the water sector and solutions to further improve asset condition over the long term. In turn, we expect the sector to invest time and effort in delivering the plan. This will require collaboration and agreement, alongside prompt action to respond to data requests and share information and insight to a level of quality that will support our outlined ambition.

3. Enhancement expenditure allowances

Enhancement expenditure is generally where there is a permanent increase, or step change in the current level of service to a new 'base' level and/or the provision to new customers at the current service level. Enhancement funding can be for environmental improvements to meet new statutory obligations, improving service quality and resilience and/or providing new solutions for water provision in drought conditions.

This section provides detail on some of the main areas of expenditure, and is structured as follows:

- Enhancement assessment criteria
- High level approach to enhancement assessment
- Environmental obligations under the Water Industry National Environment Programme (WINEP) in England and the National Environment Programme (NEP) in Wales
- Bioresources
- Meeting Habitats, Water Framework Directive and Protected Landscapes obligations
- Water resources management plans (WRMP)
- Drinking water quality improvements
- Resilience and security
- Growth at sewage treatment works
- Net zero
- Thames Water – freeform and additional requests
- Other enhancement areas

3.1 Enhancement assessment criteria

In our PR24 methodology,⁶⁵ we set out four criteria we would use to assess enhancement expenditure, namely:

1. **Need for enhancement investment** – there must be evidence that the proposed enhancement is required, including alignment with agreed strategic planning frameworks where relevant. The scale and timing must be justified and validated. Any overlaps with base allowances or previous funding must be accounted for, and for non-statutory investment there must be customer support and evidence that the need for investment is driven by factors outside of company management control.
2. **Best option for customers** – an appropriate number of options must be considered, benefits quantified, and cost benefit analysis and best value assessment undertaken, accounting for customer views where appropriate.

⁶⁵ [PR24_final_methodology_Appendix_9_Setting_Expenditure_Allowances.pdf](#) (ofwat.gov.uk), December 2022, pp. 22-27

3. **Cost efficiency** – Enhancement expenditure requests should be based on efficient costs with sufficient and convincing evidence to demonstrate efficiency. It must be clear how the company has arrived at its preferred option costs, including supporting evidence on calculations and assumptions, there must be evidence that the cost estimates are efficient, for example by benchmarking against similar scheme outturn data, industry costs or other external costs. The company must provide third-party assurance for the robustness of the cost estimates.
4. **Customer protection** – customers should be protected if the investment is cancelled, delayed or reduced in scope and these protections must cover all of the benefits that customers have funded to be delivered.

Companies were required to provide sufficient and convincing evidence on all four criteria as part of their PR24 enhancement cost business cases.

3.2 High level approach to enhancement assessment

To allow us to compare costs across companies, we generally assess expenditure separately for different types of enhancement. For example, we assess storm overflow expenditure separately to nutrient removal. This allows us to compare like for like expenditure across companies. We have defined different types of expenditure through the individual enhancement cost categories in the PR24 business plan data tables. Nevertheless, we assess multiple lines together where there is potential for costs to be apportioned differently by companies and where there is some synergy in the costs between them.

We assess enhancement costs in one of three ways:

- benchmarking;
- deep dives; and
- shallow dives.

Benchmarking is our preferred approach, as it allows us to compare historical and forecast costs across companies to estimate what an efficient cost for enhancement investment is. Where the investment area does not lend itself to benchmarking, we rely more on the assessment of evidence provided by companies in their business plans.

Whether we deep dive or shallow dive depends on the materiality of the costs and the level of uncertainty around the expenditure case, particularly in terms of the need for investment. For example, if we are not confident that the investment is required, then we will deep dive the investment.

3.2.1 Cost benchmarking

What we said in our draft determinations

At draft determination, we set out that our preferred method of assessment is benchmarking analysis. This allowed costs to be compared across companies and allowed us to set more robust allowances. For enhancement activities where most companies incur costs and we could identify appropriate cost drivers, we developed econometric or unit cost models. We used forecast and historical data depending on appropriateness and availability.

Due to a significant increase in the scale of enhancement expenditure compared to previous controls, we developed scheme level cost benchmarking for the largest and most complex areas to allow us to better set expenditure allowances. For other areas we applied company level or unit cost benchmarks.

If requested costs were significantly higher than modelled allowances, we provided an uplift to modelled allowances if there was compelling evidence that the costs were outside the model scope and modelled allowance were insufficient in the round. We made bespoke adjustments for example if only some part of the additional cost was justified.

Stakeholders' representations

Most companies supported our use of benchmarking and our move to scheme level modelling. In general, companies supported our approach to use more granular scheme level modelling as an improvement on the company level approach, and the use of deep dives for schemes where benchmarking was not feasible. Several companies raised concerns about the overall scale of our efficiency challenge to their individual investment programmes, however that was not necessarily reflected in their representations on individual area assessments. Companies have provided targeted feedback focusing on areas where the models result in a more significant efficiency challenge.

Model limitations: Companies challenged the models in some areas where they said the approach is not sufficiently robust, or models were too simplistic, failed to take into account location-specific or solution-specific costs (as specified by the Environment Agency or Natural Resources Wales) or did not reflect the actual costs involved in the relevant activities. Some representations stated that our enhancement modelling did not properly take account of larger, more complex schemes. In some areas, companies stated that they had undertaken their own econometric modelling, but could not come up with a more robust approach.

Deep dives: There was support for the use of deep dives (from Anglian Water and Severn Trent Water) with some companies requesting that we take more account of company/scheme specific information through deep dives and outlier assessments. For example, Anglian Water stated that "when companies have provided additional evidence to demonstrate that these schemes lead to higher efficient costs, it is appropriate to depart

from the modelled approach and rely on deep dives as proposed by Ofwat" and Yorkshire Water proposed a deep dive approach as an alternative to modelling the smart metering programme.

Statistical outliers: Companies supported our approach to assessing statistical outliers in scheme level models through a deep dive approach. For example, Severn Trent stated that "given outliers are not suitable for modelling, allowing the requested totex for efficient outliers and deep-diving inefficient outliers is a prudent option". For the outliers identified in draft determinations, companies provided additional evidence for us to reflect in our assessment for final determinations. They also asked for more deep dive assessments where schemes, not identified as statistical outliers, have unique characteristics that are not captured well in modelled approaches.

Use of historical and forecast data: Some companies commented on the use of historical data to estimate scheme level models to set efficient cost allowances. The key issue for all companies that represented was the use of historical data and the degree to which it can explain costs for PR24 schemes. Companies did not agree with the equal weighting we placed on the historical and forecast models and suggested greater weight be given to models based on forecast data.

All representing companies mentioned the relatively poorer model performance of the historical models. For phosphorus models, some companies state that one of the key reasons for the poor historical costs models performance is that the PR24 programme has a lot more small sites with stricter permits being upgraded. This leads to a higher efficient cost at these sites that is not captured well by the models. For storm overflows, companies state PR24 schemes are not subject to stringent cost-benefit tests historical schemes were subject to, leading to the inclusion of higher cost schemes. Thames Water states that the historical cost models do not perform as well as they do not account for the material reduction in supply chain availability.

Our assessment and reasons

Having considered the stakeholders' responses, we maintain our enhancement modelling approach for the final determination, though we do make some changes to the details. We explain these below.

Model limitations: We have considered company proposals for additional variables and cost drivers, and included these where they lead to improved robustness of our models. We have considered company representations on the robustness of models, and where we have been unable to achieve a reasonable level of confidence, we have changed to a deep dive / shallow dive approach. For examples, for Investigations, Flow Monitoring at STW and MCERTS monitoring.

Where companies have provided further evidence of specific exogenous factors impacting costs, we have considered these within our assessment.

We recognise that large complex schemes can have different cost profiles to smaller schemes, and so have expanded the scope of our large scheme assessment. For final determinations we consider a total of 28 schemes (21 in the draft determination) with a total delivery cost of £5.5 billion (£4.5 billion in the draft determination).

Deep dives / Statistical outliers: We recognise that there are instances where the specific requirements of a scheme may mean that it will have a difference cost profile to other schemes and will not be suitable for modelling. We have undertaken further analysis of company proposals and engaged extensively with companies and environmental regulators to identify such specific schemes or groups of schemes, which require assessing separately, via deep dive. This has included Biological Phosphorus removal, and storm overflow hybrid solutions that include significant 'green' (i.e. nature-based) components with higher costs than purely 'grey' (i.e. concrete) solutions but also higher benefits.

Where companies have provided additional information as part of their representations, we have reassessed our outlier assessments.

Use of historical and forecast data: We recognise there are some differences in the type of schemes between PR19 and PR24. This is why we only set 50% weighting on historical cost models and not a larger percentage. Where historical data provides a very stringent efficiency challenge, we retain the use of forecast data only (for example storm overflows storage at STWs). We are retaining our approach on weighting between historical and forecast cost models. This provides additional outturn cost evidence to complement the use of forecast data in our modelling approach.

Our final determination

For final determination we maintain our draft determination approach to apply the use of cost benchmarking to assess enhancement expenditure. For enhancement activities that are comparable between companies, and where companies therefore incur costs that can be benchmarked between them, we identify appropriate cost drivers and develop econometric or unit cost models. We use forecast and historical data depending on appropriateness and availability. We use benchmarking to assess about £30 billion of enhancement expenditure.

We do not apply a common efficiency challenge to all enhancement costs. Our efficiency challenge is dependent on the quality of the model and the spread of company cost projections around our benchmarks. In some models we do not apply a further challenge beyond the average predictions. That is, we set as an allowance the cost predicted by the model (for example, the regression 'line', or conditional mean, in econometric models). In other models we apply a discretionary efficiency challenge that goes beyond the average cost performance.

We use scheme level cost benchmarking for the largest and most complex areas. Scheme level models use data at an individual site level. This allows differences in the portfolio of projects being taken forward by companies to be more accurately reflected in allowances. These models alleviate some of the disadvantages of aggregate models, including size of the sample and transparency of allowances for each site. Further details of our scheme level enhancement approach are included in 'PR24 final determinations: Expenditure allowances - Enhancement cost modelling appendix'.

When applying cost benchmarking, we considered if there is a need to adjust benchmark allowances for individual schemes or companies. If the requested cost for a scheme / company is significantly higher than the allowance from the benchmarking model (i.e. it is an 'inefficient' outlier from the model), we consider whether there is compelling evidence to support the additional cost above the modelled allowance. We assess this through targeted deep dives, which consider whether requested costs are outside the model scope, whether the modelled allowance would be insufficient in the round to deliver the activity, or whether certain factors in relation to the proposed activity would be a material driver of cost not fully captured in our model.

For scheme level models, if the company provides compelling evidence, we provide the company with requested costs in full. If it does not provide compelling evidence, we make an adjustment ranging from:

- Minor concerns - we provide the modelled allowance plus 75% of the gap between company request and modelled allowance.
- Some concerns - we provide the modelled allowance plus 50% of the gap between company request and modelled allowance.
- Significant concerns - we provide the company with the modelled allowance (effectively no model adjustment).

In some cases, we make bespoke adjustments to modelled allowances, for example if only some part of the additional cost is justified. Model adjustment deep dives are applied both to company level models, and to individual schemes identified through the scheme level modelling.

3.2.2 Deep dives

What we said in our draft determinations

At draft determination, where the investment area did not lend itself to econometric modelling or unit cost benchmarking, our assessment was based on the written evidence provided in the business plans.

We undertook deep dive assessments where costs were material and the cost requested is greater than 0.5% of the water or wastewater wholesale totex, or greater than £10 million. Whether we deep dive also depends on the uncertainty around the expenditure case, particularly in terms of the need for investment. For example, if we are not confident that the investment is required, then we undertook a deep dive of the investment.

In a deep dive, we assessed the quality of the evidence provided by the company for the need for investment, best option for customers, cost efficiency and customer protection for the proposed expenditure.

Where the need was not fully evidenced, for example due to non-alignment with strategic planning frameworks, for example WINEP or NEP, overlaps with base expenditure or previous funding, or the need for investment is poorly quantified, we applied a cost challenge of up to 100% based on our assessment. For example, we identified the overlap with base or previous funding and made relevant adjustments to achieve alignment with strategic planning frameworks.

Where we accepted the need for the investment, but the company had not provided sufficient and convincing evidence that the investment is the best option for customers, we applied a percentage challenge ranging from 10% for minor concerns, 20% for some concerns and 30% for significant concerns. This reflected that a rigorous optioneering approach may have led to more cost efficient or best value solutions being identified.⁶⁶

Where companies did not provide sufficient and convincing evidence that costs are efficient, there is a risk that the cost requests were too high and customers would be overpaying and not receiving value for money. In the absence of appropriate evidence of cost efficiency, we applied a percentage challenge ranging from 10% for minor concerns, 20% for some concerns and 30% for significant concerns. We also applied bespoke cost efficiency challenges when external cost benchmarks are available to align with these benchmarks. We determined the 30% cost efficiency challenge on evidence on the cost ranges we observed between companies on common and repeatable activities.⁶⁷

Stakeholders' representations

Some companies raised specific issues with how the assessments were undertaken. For example, Southern Water claimed that we overlooked crucial contextual factors and evolving regulatory pressures when assessing need. Likewise, Northumbrian Water stated that there was insufficient justification behind the application and scale of deep dive efficiencies, and a

⁶⁶ We found 33% and 37% differences at P10 (for water and wastewater respectively) between companies presented costs to deliver their business plans (considered best value) and least cost business plans, and 50% differences between WRMP preferred and feasible unit cost.

⁶⁷ This was derived from analysis of variance in unit costs for new meter installations, lead communication pip installations and new interconnectors, where the range in unit cost was found to be between 32% and 100%.

perceived lack of evidence that alternative options could be cheaper, or that costs are higher than others.

Northumbrian Water, Wessex Water and Southern Water objected to the application of generic efficiency challenges, stating that generic efficiency challenges did not accurately reflect efficiency and specific scope challenge.

Our assessment and reasons

We prefer cost benchmarking to deep dives as it allows us to compare costs across companies rather than relying only on company evidence which can be beset by information asymmetry. We continue to consider that we should apply deep dives at final determination where cost benchmarking is unfeasible or lacks robustness.

We have considered the need for additional deep dives on a line-by-line basis, which is further detailed in 'PR24 final determinations: Expenditure allowances – Enhancement cost modelling appendix'.

We have considered company representations to specific deep dives to determine whether we have overlooked any key contextual factors or evolving regulatory pressures, and provide detailed responses in the deep dive writeups contained within individual models.

Given the information asymmetry between Ofwat and companies, we continue to consider that it is companies' responsibility to provide sufficient and convincing evidence to support their expenditure proposals and requests for customer funding. Our draft determination deep dive challenges were based on evidence of the impact of poor optioneering or cost efficiency. However when applied together there was a risk that these challenges could lead to insufficient funding to deliver specific outcomes. We have therefore adjusted our approach by:

- Reassessing base overlap challenges so, where possible, they better reflect the specific area of expenditure that are expected to be covered by base.
- Reducing the scale of the optioneering challenge so that it is a maximum of 20% unless we have evidence that suggests an alternative option could reduce costs further.
- Reducing the cost efficiency challenge so that it is a maximum of 10% unless we have evidence that suggests a greater efficiency challenge is appropriate, for example alternative cost benchmarks, and
- Only applying cost efficiency challenges in addition to optioneering challenges where there is evidence that these are appropriate.

Our final determination

Our approach for final determination is to retain the deep dive assessments where costs are material; the cost requested is greater than 0.5% of the water or wastewater wholesale totex,

or greater than £10 million. In a deep dive, we assess the quality of the evidence provided by the company for the need for investment, best option for customers, cost efficiency and customer protection for the proposed expenditure.

In deep dive assessments, we are conscious that we are looking at a single company's cost proposals and so there may be a large information asymmetry between Ofwat and the company. The company is better placed to know what the best options and efficient costs are, but its proposals may not reveal this information to Ofwat. We therefore challenge companies to provide sufficient and convincing evidence to justify their proposals. Where companies provide such evidence aligned to the enhancement criteria, we apply no cost challenge, as we can be relatively confident that the investment addresses the need, is the best option for customers, and is efficient. Where this is not the case we make challenges to the company cost proposals, to protect customers against the risk that better evidence would identify lower costs. Our cost challenges reflect each of the criteria being assessed and are additive, with an in-the-round assessment to ensure that the sum of the overall challenge remains reasonable and that the allowance is sufficient for the company to effectively deliver the output/outcome.

Where the need is not fully evidenced, for example due to non-alignment with strategic planning frameworks, for example WINEP or NEP, overlaps with base expenditure or previous funding, or the need for investment is poorly quantified, we apply a cost challenge of up to 100% based on our assessment, with base overlap adjustments aligned to what could reasonably be expected to be covered by base. For example, we identify the scale of the overlap with base or previous funding and make relevant adjustments to achieve alignment with strategic planning frameworks.

Where we accept the need for the investment, but the company has not provided sufficient and convincing evidence that the investment is the best option for customers, we apply a percentage challenge.

Where we applied a deep dive challenge at draft determination, if the company has made no representation, then we retain our draft determination position. If a company addresses our concerns in full, then we remove our challenge. If there is still some evidence lacking then:

- for 'best option for customers,' if we determine that the company has chosen the best option for customers then we remove the challenge, if we are able to identify an alternative option that has not been assessed which could potentially be better, we seek to determine how much lower the cost of this would be, and adjust the challenge accordingly. If there is still some evidence lacking – but based on company evidence of optioneering and the cost of potential alternative options we cannot clearly identify the cost of the alternative option, we make a judgement on whether to apply a 10% or 20% or challenge informed by efficiencies identified in other related areas.
- for 'cost efficiency,' based on the evidence submitted and expert judgement – we consider whether the company is likely to incur the proposed cost if operating efficiently.

If not, then we set the efficiency challenge taking into account the companies own benchmarking evidence, cross company comparisons and our own benchmarking/cost comparisons, and potential for further value engineering. If we do not have other information available to set an efficiency challenge, then we apply a 10% adjustment. If we have applied a best option challenge, then we do not apply a cost efficiency challenge also, unless we have evidence to suggest that it is appropriate to do so.

For 'customer protection' we assess whether there is a need for a Price Control Deliverable. Where a company's proposed investment for an enhancement area meets or exceeds the materiality threshold, we apply a PCD. We also apply a PCD for enhancement areas where a company's proposed investment does not meet the materiality threshold but we still have concerns that customers are not sufficiently protected. For enhancement areas where a company's proposed investment is below the materiality threshold and we are satisfied that sufficient customer protection is provided, we do not apply a PCD.

3.2.3 Shallow dives

What we said in our draft determinations

At draft determination, we carried out shallow dives on less material investment lines. In general, we carried out a shallow dive assessment where the expenditure was less than 0.5% of the water or wastewater wholesale totex or less than £10 million. Where appropriate, we applied discretion as to whether to apply a deep dive assessment for investments close to this threshold or with a higher risk profile.

We derived the company specific challenge by examining the cost efficiency of companies in the enhancement benchmarking models used in our cost assessment. Given the greater scale of enhancement expenditure and the greater scope and detail of enhancement cost benchmarking models in PR24 we consider that PR24 enhancement models provide a reasonable indication of a company's opportunity for efficiency in other enhancement areas. We capped shallow dive cost efficiency challenges at 20% to avoid disproportionate interventions for companies where we have not examined costs in detail.

Stakeholder representations

In their representations, South West Water, South East Water, Wessex Water, and Thames Water challenged the use of a 20% maximum efficiency challenge, for reasons including:

- the scale of the challenge is twice that of PR19 approach and is not justified;
- the underlying enhancement models are not robust, meaning base costs are a more appropriate proxy for overall company efficiencies; and
- applying this scale of challenge to immaterial expenditure results in an unjustified (and therefore material) challenge.

Northumbrian Water states the inclusion of its Industrial Emissions Directive (IED) costs within the shallow dive calculation constitutes an error, given that it has not requested any funding for IED as part of the Price Review 2024.

Wessex Water states that while it disagrees with the shallow dive approach, a 10% cap as applied at PR19 is more reasonable and appropriate and provides a constructive and pragmatic solution.

Two companies responded to us on the selection of models used to set the shallow dive efficiency challenge. Southern Water recommended omitting P-removal, Bioresources, IED and leakage from the models that go into the shallow dive assessment to ensure that preferred models pass the highest threshold of robustness and applicability. South West Water also recommended discarding leakage enhancement expenditure from the shallow dive assessment.

Our assessment and reasons

We do not accept that base models provide a better proxy for efficiencies in enhancement spend. Base cost covers a much broader set of activities and requirements than covered by enhancement, for example operations and capital maintenance. The enhancement models better reflect the range of activities covered by other areas of enhancement spend. For example, we would expect all enhancement activity to require capital delivery and client-side management, and most also to require some form of procurement. This is not the case for base activity. In addition, there is not the same degree of asymmetry of information in the base models.

We have assessed the range of models inputting into the shallow dive efficiencies. A better indication of company enhancement efficiency can be achieved by including the outlier and deep dive elements of modelled cost areas. This allows better consideration of where companies are proposing activities not fully captured by the model and have been able to provide sufficient and convincing evidence to support this.

We recognise concerns that a 20% challenge on immaterial expenditure that has not been assessed in detail could potentially lead to insufficient funding to deliver some improvements. Without a detailed assessment of all the shallow dive costs it is difficult to conclude the scale of risk.

We agree with Northumbrian Water's view that its IED costs should not be included in the shallow dive calculations, as its numbers relate to delivery of schemes funded as part of PR19.

Conversely, we disagree with Southern Water's view that IED should be dropped on the basis of robustness, as the majority of costs in this line are modelled and we have improved the robustness of the model since draft determinations. We also disagree with its view that we

should drop P-removal on similar grounds, as we consider that this model is a good indication of efficiency as it combines historical and forecast costs.

We agree with Southern Water and South West Water's arguments to exclude the leakage model from the shallow dive efficiency challenge and we have removed this model from the benchmark.

Our final determination

For final determination, we continue to carry out shallow dives on less material investment lines. In general, we carried out a shallow dive assessment if the expenditure is less than 0.5% of the water or wastewater wholesale totex and less than £10 million. Where appropriate we apply discretion for investments close to this threshold or with a higher risk profile, as to whether to apply a deep dive assessment instead. The shallow dive assessment is useful as it enables us to adopt a risk based process to setting allowances for requests that cannot be modelled, and that are not material enough to justify a full deep dive assessment.

We continue to derive the company specific challenge by examining the cost efficiency of companies in the enhancement benchmarking models used in our cost assessment. Given the greater scale of enhancement expenditure and the greater scope and detail of enhancement cost benchmarking models in PR24, enhancement models provide a reasonable indication of a company's opportunity for efficiency in other enhancement areas.

We reduce the cap on shallow dive cost efficiency challenges to 10%. This avoids potentially disproportionate interventions for companies where we have not examined costs in detail.

We have adjusted the benchmarking models that we have included in the assessment so that these focus on areas where modelled costs make up the majority of costs, and costs are not subject to significant post modelling adjustments. This has led to the removal of Supply, Leakage and Investigations for the water enhancement shallow dive calculation, and Chemicals Removal and Sludge Storage Cake for the wastewater enhancement shallow dive calculation.

We have expanded the scope of costs considered in deriving the shallow dive efficiency calculation to include any outlier or deep dive elements associated with modelled areas, to account for areas where companies have provided justification for higher efficient costs than modelled allowances alone. For growth at sewage treatment works, we have not included in the numbers the adjustments made for past delivery and dry weather flow compliance, as including these numbers would not be a true indication of efficiency because they are post-modelling adjustments.

At final determinations, we maintain the use of the supply interconnectors, demand, lead, metering and raw water deterioration models as benchmark models for setting the water enhancement shallow dive efficiency challenge. For the wastewater shallow dive efficiency

challenge, we maintain the use of the continuous water quality monitoring, storm overflow, phosphorus removal, sanitary parameters, septic tank, growth at sewage treatment works, first time sewerage, and Industrial Emissions Directive (IED) models as benchmark models. We find that these models are still strong indicators of efficiency given they are majority-modelled, using robust datasets to set well-evidenced benchmarks in each of their areas, which can act as effective universal indicators of efficiency.

Since draft determinations, we have removed investigations, leakage and supply models as benchmark models for setting the water enhancement shallow dive efficiency challenge. We have removed chemicals removal and sludge storage cake as benchmark models for setting the wastewater enhancement shallow dive efficiency challenge. These models are no longer majority-modelled and therefore are no longer deemed as robust an indicator of efficiency.

The cost benchmarking models used to derive the shallow dive efficiencies are shown in Table 12 and the shallow dive cost challenges in Table 13.

Table 12: Shallow dive efficiency calculation inputs

Water	Wastewater
Supply Interconnectors	Continuous Water Quality Monitoring
Demand	Storm overflows
Metering	Phosphorus removal
Lead	Sanitary parameters
Raw water deterioration	Septic tank
	Growth at Sewage Treatment Works
	First time sewerage
	Industrial Emissions Directive (IED)

Table 13: Shallow dive cost challenge

Company	Shallow dive challenge (Water)	Shallow dive challenge (Wastewater)
Anglian Water	2.00%	0.00%
Dŵr Cymru	1.00%	0.00%
Hafren Dyfrdwy	0.00%	0.00%
Northumbrian Water	0.00%	8.00%
Severn Trent Water	0.00%	5.00%
South West Water	10.00%	1.00%
Southern Water	10.00%	8.00%
Thames Water	0.00%	10.00%
United Utilities	0.00%	10.00%
Wessex Water	7.00%	10.00%
Yorkshire Water	0.00%	5.00%
Affinity Water	3.00%	N/A

Company	Shallow dive challenge (Water)	Shallow dive challenge (Wastewater)
Bristol Water	6.00%	N/A
Portsmouth Water	7.00%	N/A
South East Water	10.00%	N/A
South Staffs Water	0.00%	N/A
SES Water	10.00%	N/A

Where we do not consider our dataset to be sufficiently robust to undertaken econometric modelling, but we consider that it provides an indication of the efficient cost benchmark, we assess costs against the indicative cost benchmark. If we consider the cost benchmark to provide a reasonable indication of efficiency, we remove the shallow dive challenge, giving companies that are efficient against the indicative benchmark their full request. Where we have low confidence in the indicative benchmark, we continue to apply the shallow dive challenge to those companies below the indicative benchmark. Companies above the indicative benchmark are assessed via deep dive.

3.2.4 Reallocations and base overlaps

What we said in our draft determinations

At draft determination we set out that to allow us to assess companies fairly, we review company reporting of enhancement costs across the 42 water and 59 wastewater enhancement categories to improve consistency of reporting. Where we considered that the cost was not reported in the appropriate place, we re-allocated the costs to enable consistent assessment of costs.

We also reviewed companies' classification of costs as enhancement. Where we considered costs to be part of the normal running of the business, we disallowed the costs as enhancement. We consider that such costs are included in our base cost allowance and make no further adjustment.

For company proposals for water treatment works rebuilds, refurbishments, or significant upgrades we make cost challenges to account for the likely base overlap. However, we expect the company to present its calculation of base implicit allowance so that it only requests incremental enhancement costs for the proposed activity.

Stakeholder representations

We received a broad range of company and non-company representation on reallocations and base overlap.

Companies suggested that we had increased our expectations on what can be achieved through base expenditure, which will reduce available funding for other base activities.

Non-company responses challenged whether companies had already been funded for the proposed improvements. Natural Resources Wales noted the clear message to companies in Wales relating to historical under delivery through base expenditure and asked how Ofwat will ensure companies will be funded to make adequate investment going forward. It stated that, "there are a number of sites where this decision by Ofwat has resulted in the companies not securing full funding for improvements that Natural Resources Wales consider are critical for environmental protection and improvement. Natural Resources Wales does not dispute Ofwat's findings, however, [we] are concerned that the required investment may be sidelined by other base expenditure pressures or due to the significant % of the relevant companies base expenditure that will have to be assigned to a single scheme."

Afonydd Cymru supported Ofwat's decision to move investment in the determination from enhancement to maintenance. However, in doing so, it considered that Ofwat must ensure that the base maintenance expenditure will adequately fund all the base maintenance requirements needed.

The Environment Agency stated that it would like to see greater granularity on which sites 'base' costs are applied to. It said "this area of investment is critical to improving company performance and tackling the integrated challenges around surface water flooding, storm overflows, pollution incidents and wastewater treatment works compliance."

Our assessment and reasons

Our regulatory regime gives companies flexibility as to how they invest their base expenditure allowances to deliver good outcomes for customers and the environment. Water companies should manage cycles of maintenance across large, diverse asset bases within their long-term base expenditure allowance, spending more than the base allowance in some regulatory periods and less than the base allowance in other regulatory periods. This is facilitated through cost sharing, which allows companies to recover a proportion of overspend from customers.

Our approach to base overlap is consistent with the approach used in PR19. In several cases companies have accepted our draft determination base overlap challenges in their representations. Companies have also submitted additional evidence and/or amended proposals in other cases where we have challenged on base overlap.

We propose to continue to challenge companies on need where we consider that expenditure has been otherwise funded, for example through base expenditure allowances or through previous enhancement allowances. This ensures that customers do not pay twice for activities previously funded through base allowances, and encourages companies to continue to undertake renewal and maintenance work through base allowances.

Where companies have significantly underdelivered historically against average spend in certain areas, and this under delivery is used as the basis for a base overlap challenge, it is reasonable to hold the company to account for that delivery in PR24, to ensure that good outcomes for customers and the environment are achieved. In this situation we apply a PCD to hold the company to account for delivery.

Our final determination

For final determination we continue to review company reporting of enhancement costs across the 42 water and 59 wastewater enhancement categories to improve consistency and enable like-for-like assessment of comparable investment, which we aggregate up into the enhancement areas listed in the table below. Where we consider that the cost was not reported in the appropriate place, we re-allocate the costs to enable consistent assessment of costs.

We review companies' classification of costs as enhancement. Where we consider costs to be part of the normal running of the business, we disallow the costs as enhancement. We consider that such costs are included in our base cost allowance and make no further adjustment.

For company proposals for water/sewage treatment works rebuilds, refurbishments, significant upgrades we make cost challenges to account for the likely base overlap, so that it only requests incremental enhancement costs for the proposed activity.

Where we have rejected material expenditure due to base overlap, but there is a clear need for investment related to historic underspend, we have included price control deliverables that hold the company to account for future under delivery.

3.2.5 Assessment area summary

The table below summarises the amount of investment assessed through each of the three assessment methods.

Table 14: high-level approach to assessing each enhancement area

Method of Assessment	Enhancement Area	Totex Assessed (£ million)
Deep/shallow dive (£13.096 billion)	Strategic resource options	2364
	Wastewater - Freeform lines	1758
	Water - Resilience	1436
	GHG reduction	790

Method of Assessment	Enhancement Area	Totex Assessed (£ million)
	SEMD	765
	Water – Freeform lines	692
	Flow compliance (WWT)	672
	Water – Water Framework Directive	620
	Wastewater – Investigations	508
	Cyber security	495
	Chemicals	492
	Bathing and shellfish waters	423
	Interconnectors – Resilience	414
	Reservoir safety	403
	Wastewater – Resilience	345
	Water – Investigations	250
	Biodiversity and conservation	228
	Nutrient removal	133
	Eels, fish & salmon	100
	Wastewater – 25-year environment plan	73
	Invasive and non-native species	47
	EDMs	29
	Advanced WINEP	26
	Marine conservation zones	15
	Water – 25-year environment plan	11
	Discharge monitoring	4
	Wastewater – Other	0.3
Modelled (£2.996 billion)	Supply-demand balance	2077
	CWQM	669
	First time sewerage	163
	Septic tanks	87
Modelled/deep/shallow dive (£31.982 billion)	Storm overflows	11968
	Nutrients	6767
	Growth at STW	2384
	Sanitary parameters	1775
	Raw water deterioration	1706
	Metering	1650
	Industrial emissions directive (IED)	1509
	Interconnectors – Supply	1368
	Leakage	925
	WINEP/NEP Bioresources	807
	Lead	462
	Taste, odour and colour	385
	Drinking water protected areas	156

Method of Assessment	Enhancement Area	Totex Assessed (£ million)
	Habitat restoration	99
	Odour and nuisance	22

3.3 Environmental obligations under the WINEP in England and the NEP in Wales

The water industry national environment plan (WINEP) in England and national environment programme (NEP) in Wales are key mechanisms for improving the impact of the water sector on the natural environment. Investment through the WINEP/NEP is substantial and has amounted to £25 billion since 1989.⁶⁸

The WINEP/NEP set out the water company actions required by the Environment Agency and Natural Resources Wales to meet certain environmental legislative requirements in England and Wales. These requirements can be statutory (S) or statutory plus (S+). Statutory plus actions are subject to a cost benefit test, whereas statutory requirements are not. Some non-statutory (NS) actions are also included. We expect all companies to submit business plans that deliver all of the PR24 WINEP/NEP actions. Some items classified as “statutory plus” or “non-statutory” nevertheless relate to actions necessary to comply with environmental legislation. Neither should the WINEP/NEP be taken as defining legally the limits of what is required of companies under environmental legislation. Companies are responsible for fully complying with all of their environmental obligations at all times.

Companies have increased their proposed expenditure to meet their obligations under the WINEP/NEP for PR24 from £25 billion at draft determination, to £26 billion. This represents the water industry's largest proposed investment programme for environmental improvements to water bodies since privatisation. For comparison, the total allowance for WINEP/NEP expenditure in PR19 was £5 billion (in 2022–23 prices). This should result in 13,500 km of rivers, and an area of 10,556km², of enhanced/protected area/water body in England under the WINEP⁶⁹, with a further 1,539km of rivers expected to improve in Wales under the NEP⁷⁰.

We have worked with companies, the Environment Agency and Natural Resources Wales so that we have a good understanding of the requirements of the WINEP/NEP.

The scale and scope of the PR24 WINEP and NEP are significantly greater than in previous price reviews. This is driven predominantly by the requirements for storm overflow

⁶⁸ [Water industry national environment programme \(WINEP\) methodology](https://www.gov.uk/government/publications/water-industry-national-environment-programme-winep-methodology) – GOV.UK (www.gov.uk), May 2022.

⁶⁹ Values provided by the Environment Agency.

⁷⁰ The Environment Agency and Natural Resources Wales are currently determining the degree to which PR24 water company improvements will contribute to achieving good status by 2030.

improvements introduced by the Environment Act 2021, and nutrients and other WINEP/NEP drivers arising from the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (WFDR), the Conservation of Habitats and Species Regulations 2017, Urban Waste water Treatment (England and Wales) Regulations 1994 (UWWTR), Habitats Directive (European Union Council Directive 92/43/EEC), and sensitive area designations. Some non-statutory actions may also be included relating to the 25 Year Environment Plan. Although there have been WINEP/NEP improvement actions under the WFDR for several price review periods, PR24 represents the statutory completion deadline for any remaining WFDR improvement actions, alongside a number of 'no deterioration' actions. There continue to be new WINEP/NEP actions because of the Conservation of Habitats and Species Regulations and the UWWTR due to new area designations and population increases over UWWTR thresholds.

In many areas companies reduced their costs between draft determination and final determination, in acceptance of efficiency challenges. However, overall there was a £1 billion increase in WINEP/NEP expenditure proposed, primarily due to: £1.1 billion increase in storm overflows (WINEP and non WINEP) due to an additional 351 schemes and 500,000m³ storage volume to reduce spill frequency and accelerate delivery of the Storm Overflows Discharge Reduction Plan. £300 million increase in Microbiological treatment costs due to new schemes added to reflect the designation of additional bathing waters. £200 million increase in total nitrogen removal as some alternative proposals to meet the requirements introduced by the Levelling Up and Regeneration Act (LURA) were not approved. The increase is largely due to the construction of a long sea outfall by Northumbrian Water at Bran Sands STW.

- £128 million increase in Phosphorus removal due to reassessment of costs made by Anglian Water.
- £50 million increase in MCERTs monitoring at Pumping Station Emergency Overflows to reflect the new near real time emergency overflow discharge reporting duty in the Water (Special Measures) Bill.

We have based the final determination on the latest available version of companies' WINEP/NEP from the Environment Agency and Natural Resources Wales. For companies in England this is the version of WINEP provided by the Environment Agency on 5th July 2024. For Dŵr Cymru this is version 8 of their NEP and for Hafren Dyfrdwy version 6.2.

We validate the need for each investment area against companies' obligations set out in the WINEP/NEP. We do not challenge the need for company proposals under WINEP/NEP enhancement expenditure where requirements are needed to comply with statutory obligations and they are validated against the WINEP/NEP, and where companies provide sufficient and convincing evidence that there are no funding overlaps with base or previously funded WINEP/NEP activities.

3.3.1 Wastewater WINEP/NEP

Companies have proposed around £25 billion of expenditure on the wastewater WINEP/NEP. The main wastewater WINEP/NEP elements are:

- storm overflows investigation and improvements
- continuous water quality monitoring
- monitoring discharges at emergency overflows
- phosphorus removal
- total nitrogen removal and nitrogen technically achievable limit investigations
- sanitary parameters removal
- chemicals removal and investigations
- bathing waters
- shellfish waters
- marine conservation zones
- sludge use in agriculture
- replacement of direct discharge septic tanks; and
- the 25-year Environment Plan

The main areas for WINEP/NEP investment are summarised in the following sections.

3.3.2 Storm overflows

The impact of spills from storm overflows on our rivers is not acceptable. There is a need to significantly improve river and bathing water quality by reducing spills and ecological harm from storm overflows.

Storm overflow improvements are the largest area of the WINEP/NEP, accounting for around £12 billion of proposed expenditure. Most of this expenditure is to reduce the impacts of spills from storm overflows but it also includes expenditure for continuous water quality monitors and event duration monitors. This enhancement investment will address spills at 2,884 overflows and combined with our expected improvements from base expenditure will lead to a reduction in spills of 176,590 per year over the next five years.

For PR24, storm overflow improvements in England are largely driven by new requirements introduced by the Environment Act 2021, in particular the requirement for Defra to have a plan to reduce the number and adverse impact of discharges from storm overflows of companies in England. Defra's Storm Overflows Discharge Reduction Plan⁷¹ sets several targets for water companies, including to only discharge from a storm overflow where they can demonstrate that there is no local adverse ecological impact. This target must be achieved for at least 75% of storm overflows discharging into or near 'high priority sites', and all designated bathing waters by 2035, for 100% of storm overflows discharging into or near 'high priority sites' by 2045, and for all remaining storm overflows sites by 2050. The Plan

⁷¹ [Storm Overflows Discharge Reduction Plan \(publishing.service.gov.uk\)](https://publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1154442/storm-overflows-discharge-reduction-plan.pdf), September 2023

includes a further target that storm overflows must not discharge above an average of ten rainfall events per year by 2050. All storm overflows are also required to have screening controls that avoid pollution by limiting the discharge of persistent inorganic material and of organic solids. Investment to meet these targets is included within the WINEP.

These targets are in addition to (and in many cases overlapping with) the existing legal requirements that apply to all companies set out in the Urban Waste Water Treatment Regulations (England and Wales) 1994, The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (WFDR) and requirements related to Bathing Waters and Shellfish Waters.

In Wales the requirements relating to improving the classification standard of storm overflows and reduce harm are set out in Natural Resources Wales (GN066- Assessing Storm Overflows and GN021- Unpermitted Storm Overflow guidance). Any investment required for compliance will be set out in the NEP. Compliance with this guidance will deliver legislative requirements in Wales including the Environment (Wales) Act 2016 and Urban Waste Water Treatment (England and Wales) Regulations 1994.

As set out in our PR24 methodology we expect all companies to reduce their use of storm overflows and, where appropriate, reduce spills below an annual average of 20 spills per overflow a year from 2025 onwards, without additional expenditure allowances.⁷² We stated that we would provide extra funding to reduce harm from storm overflows where government targets demonstrably go beyond current permit requirements. This protects customers from paying twice for companies to comply with their existing permit obligations.

What we said in our draft determinations

To determine an efficient allowance for schemes we benchmarked costs across companies. To do this, we grouped expenditure with similar costs, with the main cost categories for storm overflow investment being:

- Grey and grey/green hybrid solutions in the network, which relate to schemes that reduce storm overflow spills through installation of storage tanks on the sewer network, or other activities such as upsizing of pipes where the equivalent storage can be assessed.
- Grey and grey/green hybrid solutions at sewage treatment works, which relate to schemes that reduce storm overflow spills through installation of storage tanks at the sewage treatment works, or other activities such as upsizing of pipes where the equivalent storage can be assessed.
- Green-only solutions which relate to schemes that reduce storm overflow spills through installation of catchment and nature-based solutions either in the network or at sewage treatment works.

⁷² Ofwat, [PR24 final methodology: Appendix 9 – Setting expenditure allowances](#), December 2022, page 96.

Cost benchmarking was not feasible where the range of proposals was too great and there was limited historical information on the cost of delivery (for example, for green solutions). In these cases, we applied a deep dive and shallow dive approach. For Flow to full treatment schemes, due to a lack of robust data, the efficiency value of the grey/hybrid storage model for each company was used to determine the efficiency challenge, on the basis that the type of work would be similar, and therefore we could infer that the efficiency would also be similar.

We set out that where possible, we wanted companies to go further and deliver more catchment and nature-based solutions in the 2025–30 period, and had retained flexibility in our proposed price control deliverable to allow companies to deliver more green solutions instead of grey ones.

We expected all companies to reach an average of 20 spills per overflow or provide appropriate evidence for a higher target. Compared to 2021, a recent year with typical rainfall, in their business plans companies have committed to remove 21% of spills by 2025 and 35% of spills by 2029.⁷³ We challenged companies where they had not provided sufficient and convincing evidence for their 2025 spill levels. We expected English companies to remove an average of one spill per overflow with base allowances by 2029. We challenged Welsh companies to deliver at least a 25% reduction in spills compared to a 2024 baseline through base expenditure.⁷⁴ This reflects Welsh companies' starting level of spills being significantly higher than English companies'.

We expected all companies to maximise the reduction in storm overflow spills they can make over the 2025–30 period. Some companies have proposed to address far more storm overflows in PR24 than other companies. Over the sector, companies proposed to address 28% of overflows that spill more than ten times a year (based on 2021, an average rainfall year). Welsh companies proposed to address less than 10% of higher spilling overflows, so we set an expectation that Welsh companies should provide a more ambitious proposal for the spill reduction from base and enhancement expenditure in response to our draft determination.

We stated that given the proposed large investment we do not want customers to pay twice for storm overflow improvements, and set out a range of expectations on how companies must demonstrate that any enhancement funding was for going beyond existing permit conditions, or they would be subject to clawback of funding in PR29 if these conditions cannot be demonstrated.

Stakeholders' representations

⁷³ Yorkshire Water is the only company not to fully reflect its river water quality action plan commitment in its business plan.

⁷⁴ Welsh companies did not commit to spill reductions in their river water quality action plan commitments.

Generally companies agreed with the use of forecast data to estimate scheme level models. We highlight some of the key policy areas below. Further detail on these and other areas of representation are included within 'PR24 final determinations: Expenditure allowances - Enhancement cost modelling appendix'.

Scheme level/equivalent storage approach: Overall there was broad support for the approach from Anglian Water, Wessex Water and South West Water. Southern Water highlighted that it has a significant non-grey component not reflected in the models and requested a deep dive on hybrid schemes. Severn Trent agreed with the models but suggested they are overly simplistic and can be improved to better account for green elements. United Utilities strongly disagreed, saying the models were overly simplistic and challenging the robustness of the dataset. In their representations Yorkshire Water, Wessex Water and Northumbrian Water challenged the upper quartile efficiency challenge. Yorkshire Water did not support the benchmarking model due to model quality and stated that there is a risk that companies will systematically be under- or over- estimating their costs because they use different approaches to estimating scheme level costs.

Grey green swaps: Northumbrian Water stated that "Ofwat says that companies cannot substitute grey schemes with green only schemes. This seems unnecessarily restrictive, and in conflict with the SODRP which expects 'water companies to prioritise... catchment level and nature-based solutions in their planning'. Ofwat should consider how grey schemes could be substituted for green only schemes where this supports nature based solutions."

Wetlands: Wessex Water stated that the price control deliverable framework would prevent them from capitalising on opportunities to utilise more wetlands, if these were identified after final determination. Set against this, the Environment Agency stated that the use of wetlands/nature-based treatment solutions for storm overflows remains in the WINEP only for two companies, and that it expects that if these are allowed to continue, it will be on a trial basis only, at a small number of sites.

Flow-to-full treatment/pass forward flow: Thames Water and United Utilities commented on the use of flow-to-full treatment (FFT) schemes to complement storage solutions. Thames Water stated that the scale of FFT solutions could be measured better with alternative drivers such as litres per second (l/s) rather than equivalent storage. United Utilities challenged the robustness of the dataset in relation to treatment of flow to full treatment (FFT) schemes. The company said that the schemes may not be treated consistently between companies with different assumptions of how litres per second (l/s) capacity converts to equivalent storage.

Price control deliverable Anglian Water, Northumbrian Water, Severn Trent and United Utilities, raised concerns that the reliance on equivalent storage as the deliverable bakes significant uncertainty into cost allowances in the 2025-2030 period. These volumes are subject to change as for most schemes, the feasibility stage of scheme development has not been undertaken. Thames Water stated that setting specific targets for sub-components limits flexibility to meet the output that actually matters – spill frequency.

Maximise the reduction in storm overflow spills Hafren Dyfrdwy and Yorkshire Water increased their investment requests to target greater reductions in harm or spills. The Consumer Council for Water (CCW) questioned whether companies are doing enough to stop storm overflows spilling in the first place by preventing or removing blockages in the sewer system. The Environment Agency identified in 2021–23 that 18% of high-spilling overflows were due to operational issues including poor maintenance.

Targeting of spills and not harm Wales Environment Link stated that it is not convinced that water companies have provided enough evidence that they are targeting investment towards improving storm overflow that are causing the most ecological harm, or that the prioritisation they have undertaken will provide enough ecological benefit. Afonydd Cymru re-iterated that Wales' agreed target for overflows is to prioritise no ecological harm to protect river water quality. It said delivering this is more complex than simply delivering schemes to reduce spill targets and this should be recognised in the final determination.

CCW stated that customers need to know that the most harmful storm overflows are being prioritised and that companies are not just tackling the “easy” ones. CCW wanted to see companies collecting and using data to produce – and share publicly – delivery plans that clearly prioritise reducing harm and improving the environmental health of our rivers and seas.

Ensuring customers do not pay twice for storm overflow spill reductions South West Water stated that it agrees with our approach to identifying overlap with base to stop customers paying twice.

Hafren Dyfrdwy stated that it has applied proportional allocation rules to its proposed solutions to make sure that the costs are borne through base expenditure where appropriate.

Northumbrian Water, as part of its reporting on the accelerated infrastructure delivery project, provided an example of data that it considered could be used to evidence compliance with pass forward flow permit requirements, including pumping station drop tests, and hydraulic model output, and seeks clarification as to whether it is deemed to be sufficient.

Water UK set out its views on the measurement of FFT compliance at network assets in the context of Ofwat's wastewater enforcement case.

Our assessment and reasons

Scheme level/equivalent storage approach We have considered alternatives to the use of equivalent storage. Most companies have used equivalent storage as the key cost driver in their cost estimation. Volume of equivalent storage has a clear engineering rationale as it captures the volume of spill which needs to be stored and managed to mitigate storm overflow discharges. Larger storage tanks cost more to build because they require more excavation and more materials. All else being equal, we would expect companies carrying out

solutions which required greater increases in volume of storage will require higher efficient costs.

We modelled the proportion of non-grey and the proportion of green solutions as cost drivers, to test whether the prevalence of green and other storage in schemes leads to higher efficient cost. We found that the models were not robust. We recognise that some green/other solutions will have higher costs than grey solutions and will provide greater benefit, leading to an overall best value solution, but note that some schemes with a high proportion of green/other storage are more efficient than comparable grey solutions. Therefore, as an alternative we have considered schemes with a significant non-grey storage component as engineering outliers where appropriate and undertaken deep dives to determine whether higher allowances are justified.

Grey green swaps – we welcome the step change in the use of catchment and nature-based solutions but are keen that companies maximise their use when delivering improvements during 2025–30. So that there is no perceived or actual blocker to this from our PCD we propose to remove the exclusion on swaps from grey hybrid to green only, similar to how we allow swaps within the grey/green hybrid programme, subject to scheme level agreement with the Environment Agency and Natural Resources Wales.

Wetlands: With regards to increasing the delivery of wetlands as a form of storm overflow treatment, any additional swaps are subject to inclusion in the trial jointly overseen by Defra, the Environment Agency and Ofwat for alternative treatment solutions for groundwater ingress activated storm overflows⁷⁵.

FFT/pass forward flow – we agree with stakeholders that FFT schemes have different characteristics compared to storage schemes as they represent additional capacity to treat effluent at sewage treatment works. We have gathered and utilised additional information collected alongside the draft determinations to enable the cost and cost driver (litres per second) of FFT schemes to be considered in a standalone FFT dataset that we have used to create an FFT model.

Price Control Deliverable – we have considered the concerns over the uncertainty surrounding the use of equivalent storage within the Price Control Deliverable. Equivalent storage is the main cost driver for storm overflows, and therefore if there is uncertainty in companies' estimates of the volume of equivalent storage, companies may be over- or under-funded. The cost of achieving a reduction in spill frequency varies significantly depending on the volume of storage that is required to achieve it. In addition, the outcome is not a reduction in spills alone, but also the achievement of the Environment Act targets. We therefore retain the price control deliverable of equivalent storage.

Maximise the reduction in storm overflow spills – we welcome company proposals to go further on storm overflows, where this investment is supported by customers. We share

⁷⁵ As outlined in a letter from Defra to sewerage companies dated 9 August 2024.

concerns as to whether companies are doing enough to stop storm overflows spilling in the first place, and retain our challenge on companies achieving spill reductions from base expenditure, which is informed in part from the findings of the Environment Agency and Natural Resource Wales from SOAF investigations.

Targeting of spills and not harm – we acknowledge concerns over the prioritisation of storm overflows to address spills rather than harm. We are making allowances for all storm overflow improvement schemes included in WINEP/NEP, both of which prioritise storm overflows that are causing harm as a priority. We derive the company spill reduction target by calculating the spill reduction that is achieved as a by-product of achieving 'no harm,' as opposed to using this to prioritise the schemes progressed through the WINEP/NEP, which is led by the environmental regulators.

Ensuring customers do not pay twice for storm overflow spill reductions – we retain our view that customers should not pay twice for storm overflow spill reductions. Companies have been funded to comply with permit requirements. Companies need to ensure that their assets are meeting their design capacity and complying with their obligations, and that any enhancement funding goes beyond meeting existing permit requirements.

Andoversford STW

At draft determination we approved a scheme proposed at Andoversford STW by Thames Water, with an efficiency challenge. The company did not provide compelling evidence at the time regarding its high-cost request for the scheme.

In response to the draft determination, we received nine representations on Andoversford STW; from the Upper Colne Restoration Group, the Cotswold Rivers Trust, Chedworth Parish Council, Withington Parish Council, one business and four individuals. Each set out that the frequency of spills from this asset has a significant impact given its position at the head of the river and this inevitably affects everything downstream. They said there is a requirement for investment to address this.

For final determination we continue to make a cost allowance for the Andoversford STW storm overflow scheme. We provide an uplift on our benchmarked allowance as Thames Water is proposing to implement higher cost sustainable drainage as part of the solution. The scheme proposes to reduce spills from the sewage treatment works from the current position of 84 per year on average to an average of 10 per year.

We are also providing funding for a growth-at-STW scheme for Andoversford, to address the impacts of growth within the catchment.

Our final determination

For final determination we group expenditure with similar costs, with the main cost categories for storm overflow investment being:

Grey / hybrid solutions (network): This covers £6.8 billion of the requested funding and relates to schemes that reduce storm overflow spills through installation of storage tanks on the sewer network, or other activities such as upsizing of pipes that avoid the equivalent storage (where this can be assessed).

Grey / hybrid solutions (sewage treatment works): This covers £3.4 billion of the requested funding and relates to schemes that reduce storm overflow spills through installation of storage tanks at the sewage treatment works, or other activities such as upsizing of pipes.

Green only solutions: This covered £825 million of the requested funding and relates to schemes that reduce storm overflow spills through installation of catchment and nature-based solutions either in the network or at sewage treatment works.

Flow to full treatment / pass forward flow: This covered £828 million of the requested funding and relates to schemes that increase pass forward flow through the sewage treatment works in order to reduce spill frequency or drain down existing or proposed storage tanks in a timely manner to ensure storage capacity during future rainfall events. Companies have provided assurance that any flow to full treatment schemes are related to storm overflow spill reduction related enhancement schemes, and storm overflow FFT costs put forward do not overlap with any growth at STW and will not be used to address any permit compliance issues.

Other elements of the requested storm overflow improvement funding include £396 million for wetland treatment solutions, and £30 million for storm overflow screen-only schemes.

We have challenged proposed storm overflow costs through benchmarking, where possible. We have applied cost benchmarking to £11.1 billion of the £12.2 billion requested. This has highlighted that some companies have proposed much higher costs than others, to deliver the same activities. We are applying an efficiency challenge so that customers only pay for the efficient costs and do not overpay. Given the scale of cost differences for some companies, we undertook additional external benchmarking and obtained historical outturn data from companies to improve our confidence in the allowances.

Where companies proposed high proportions of green-only and other storage solutions, such as SuDS or surface water separation, we have undertaken engineering outlier assessments to determine whether there is justification for higher costs where schemes deliver greater benefit. For example, where we identified high levels of green catchment storage in the Northumbrian Water Marske and Berwick-on-Tweed catchments, which were recorded across multiple storm overflows, the schemes were identified as engineering outliers and

assessed as two catchment level schemes. Northumbrian Water provided compelling evidence as to the nature of its solutions, utilising high levels of green storage across the catchment. When assessed, the overall catchment green storage was deemed efficient at the programme level, so the full cost request was given.

Yorkshire Water submitted grey/green hybrid schemes with a high level of green equivalent storage, which was highlighted at draft determinations and the full cost request given due to the costs being efficient at the programme level when benchmarked against other similar green storage proposals from other companies. The same schemes were highlighted at final determinations and assessed as engineering outliers due to the high level of green storage. Where costs and outputs had not changed from draft determinations, the same level of challenge was applied. Where schemes had changed in scope they were assessed against green storage unit costs for the green-only model, as well as high proportion green storage schemes from other companies and assessed for efficiency. Where the schemes were considered efficient they received the full cost request.

Thames Water and Southern Water both proposed a high level of nature-based solutions as part of several of their sewage treatment work schemes. As the green storage will be applied in the catchment, and not at the STW, we identified that the green elements of these schemes were causing the relatively low efficiency in the STW cost requests. We identified these schemes as engineering outliers and undertook deep dives to assess the efficiency of the green elements against other more similar green-only and high green proportion grey/green hybrid solutions. These schemes were then given an efficiency challenge based on the deep dive results.

We also considered company requests for higher allowances due to exogenous factors where they were delivering traditional solutions, such as grey storage tanks.

United Utilities – storm overflow costs

As part of its representation United Utilities stated that the costs allowances in the draft determination did not account for various exogenous regional factors that were driving higher costs for them. As part of their representation United Utilities provided scheme level breakdowns of costs for 90 of their schemes which split out costs for 23 scheme specific 'additional' items such as contaminated land, rock excavation and land purchase. They suggested that other companies had either not included these in their cost requests, or that the impact on United Utilities was greater than on other companies.

To assess the accuracy of this, we requested information from all companies on the extent to which the main factors identified were included within their historical costs and forecast cost models. Most companies indicated that they had based their forecast costs on high-level top-down cost modelling, predominantly driven by storage volume (m³). Companies stated that this was informed by historical costs that included the majority of factors

identified, although there was some variance in the extent to which companies had historically been impacted by some factors, such as rock excavation and mine working.

Based on historical data the identified factors accounted for between 1.4% and 4% of scheme totex, with United Utilities own data indicating that these factors accounted for around 2% of its historic cost, whereas United Utilities forecast costs for these items was around 10%. Companies stated that they had included risk and optimism bias to cover additional uncertainty around the impact of these and other factors.

Where United Utilities schemes were assessed as inefficient, we used the scheme level data submitted and additional query responses, including the information on exogenous factors, to deep dive and assess the extent to which the company had provided sufficient and convincing evidence to justify higher allowances. We applied an efficiency challenge based on the evidence provided.

Cost benchmarking was not feasible where the range of proposals was too great and there was limited historical information on the cost of delivery. For example, for green solutions, where the industry has not delivered many of these. In these cases, we have applied a deep dive and shallow dive approach.

In total we allow £11.9 billion for storm overflow improvements. This is made up of £11.3 billion to address storm overflow spills, £651 million for continuous water quality monitors and £27 million for event duration monitors.

We include price control deliverables so that customers receive the storm overflow improvements and storage solutions that they have funded. Given the scale of improvement required on storm overflows, where our efficient cost benchmarks are higher than companies' costs, then we expect companies to deliver additional schemes in the 2025-30 period. In all cases water companies are expected to meet all of their obligations during the period, including section 94 of the Water Industry Act 1991 and the urban waste water treatment regulations, and also to meet new bathing water designations. We have included a storm overflow uncertainty mechanism that allows companies additional funding if needed to meet these requirements, see section 4.7.5.

We welcome the step change in the use of catchment and nature-based solutions and are keen that companies maximise their use when delivering improvements during 2025-30. PR24 will see a step increase in the use of catchment and nature-based solutions from PR19. Of the £11.3 billion to address storm overflow spills, £2.5 billion will be allowed for green solutions, including green elements of hybrid solutions. We are allowing £571 million for green-only solutions, including wetlands and green-only storage schemes. There is an additional £1.8 billion green contribution included within the grey/hybrid model allowances. We have allowed £503 million of catchment solution expenditure for Northumbrian Water, £160 million for green schemes for Yorkshire Water assessed separately as a deep dive, and

£231m for United Utilities under the A-WINEP for addressing equivalent storage through catchment and nature-based solutions.

Where possible, we want companies to go further and deliver more catchment and nature-based solutions in the 2025-30 period. We have therefore retained flexibility in our proposed price control deliverable, for the grey/hybrid schemes, that allows companies to deliver more green solutions as opposed to grey, by focussing on equivalent storage as opposed to actual storage as the main measure of delivery. In addition, we will allow companies to swap between grey / hybrid solutions and green solutions. As the range of potential options under green solutions was too wide to allow the identification of a consistent benchmark, the default position for swaps is for allowances to be based on the grey/hybrid model. Where companies can demonstrate that allowances are insufficient, and that the additional benefit justifies a higher cost, we will consider these proposals via a bespoke assessment, subject to the Environment Agency / Natural Resources Wales agreeing to the proposed alterations.

Companies must ensure green solutions comply with relevant legal obligations including environmental permits and those under section 94 of the Water Industry Act 1991, including regulation 4 of the Urban Waste Water Treatment (England and Wales) Regulations 1994. With regards to increasing the delivery of wetlands as a form of storm overflow treatment, any additional swaps are subject to inclusion in the trial jointly overseen by Defra, the Environment Agency and Ofwat for alternative treatment solutions for groundwater ingress activated storm overflows⁷⁶.

We expect all companies to publish their plans for storm overflow improvements at each location early in the 2025-30 period, to allow wider stakeholders to identify the potential to increase the use of catchment and nature-based solutions.

Ilkley bathing water

We approved a set of schemes at storm overflows and sewage treatment works related to improvements for the inland bathing water at Ilkley Wharfe as part of the accelerated infrastructure programme. At draft determination we identified proposed changes to the schemes and said that these changes (for example, to project scope) would need to be agreed by Yorkshire Water with the Environment Agency and included in the company's response to its draft determination.

In response to the draft determination we received many representations on the Ilkley proposals. The majority of these were from individual stakeholders, stating that they supported the intent to deliver better water quality in Ilkley through catchment and nature-based solutions but were concerned that this is not a position agreed with the Environment Agency. They also stated that Ofwat and the Environment Agency need to be joined up to protect the environment. One respondent stated that there is real doubt on

⁷⁶ As outlined in a letter from Defra to sewerage companies dated 9 August 2024.

whether the bathing water can ever achieve a WFD classification better than 'poor' because of the many complex and diffuse pollution sources in the wider Wharfe catchment. For that reason, the respondent said that the scheme should not be supported. Ilkley Clean River Group supported the proposed works but stated that customers should not have to pay for it, as it should have been done already as part of ongoing investment.

Yorkshire Water raised concerns over the financial impact of our performance commitment on storm overflows on the viability of the proposed treated wetland at Ilkley Sewage Treatment Works.

As set out in section 3.3, we do not challenge the need for company proposals under WINEP/NEP enhancement expenditure where requirements are required to comply with statutory obligations. We provide enhancement funding where companies need to go beyond existing permit requirements, as is the case at Ilkley. Additionally, we accept non-statutory enhancement where the company can demonstrate clear customer agreement and that the proposals are needed. This is the case at Ilkley.

We have had extensive engagement with the Environment Agency and wider stakeholders with regards to the proposals at Ilkley. We are supportive of catchment and nature based solutions, and fund those that were deemed acceptable by the Environment Agency. We set out our position on the storm overflows performance commitment in the PR24 Delivering outcomes to customers and the environment.

For final determination we provide funding for all WINEP actions that deliver improvements at Ilkley.

We expect companies to reduce storm overflow spills from both base and enhancement expenditure. In addition to reducing spills from increased storage we expect water companies to continue to make reductions in storm overflow spills from base expenditure through improved maintenance and operations. Data reported to the Environment Agency over 2020–23 indicates that on average 18–29% of storm overflow spills were due to operational and maintenance reasons. In March 2022 we wrote to wastewater companies asking them to set out how they were going to act to start tackling storm overflow issues and improve river quality to reduce harm and rebuild customer trust.⁷⁷ Several companies committed to reducing spills to an average of 20 by 2025 at no extra cost to customers.⁷⁸

⁷⁷ Ofwat, [Letter from David Black to water company CEOs on environment act duties](#), March 2022.

⁷⁸ Ofwat, [Ofwat response to wastewater company river water quality action plans](#), June 2022 and Defra, [Storm overflow discharge reduction plan](#), September 2023, Annex 4.

As set out in PR24 methodology, we expect all companies to reach an average of 20 spills per overflow (or better) or provide appropriate evidence for a higher target. Compared to 2021, a recent year with typical rainfall, companies have committed to remove 21% of spills by 2025 and 41% of spills by 2029.⁷⁹ At draft determination we challenged companies to go further, and we welcome the decision from Northumbrian Water to go further through base expenditure, committing to more than the 5% challenge set at draft determination. Additionally, Northumbrian Water and Hafren Dyfrdwy have set out further enhancement to deliver additional storm overflows to target reductions in overall average spills which exceed our draft determination expectations in 2029–30. We expect English companies to remove an average of one spill per overflow beyond 20 average spills with base allowances by 2029. We expect English companies to remove an average of one spill per overflow with base allowances by 2029. We accept Hafren Dyfrdwy's forecast to deliver 22% and expect Dŵr Cymru to deliver at least a 16% reduction in spills through base expenditure, setting its PR24 2029–30 PCL at the upper end of our draft determination challenge of between 20 to 30 average spills.^[4] These higher reductions from base expenditure reflect Welsh companies' starting level of spills being significantly higher than English companies. Considering the impact of enhancement expenditure, overall, we expect to see at least 45% fewer spills from 2021 to 2029 – compared to 41% proposed by companies. Overall, this represents a removal of 118,06 total spills per year. The table below details the reduction by year forecast by company and by Ofwat compared to a baseline of 2021.

Table 15: Storm overflow spill reductions⁸⁰

	Outturn spills per overflow (adjusted to assume 100% monitoring)	Company forecast spills per overflow		Ofwat forecast spills per overflow		Company reduction (compared to 2021)		Ofwat reduction (compared to 2021)			
	2020	2021	2023	2025	2029	2025	2029	2025	2029	2025	2029
Anglian Water	24	24.4	22.9	19.9	17.4	19.9	17.4	18%	29%	18%	30%
Dŵr Cymru	54.8	45.3	55.9	44.9	33.9	42.9	30	1%	25%	5%	34%
Hafren Dyfrdwy	27.9	38.7	38.7	37.8	17.3	37.8	17.3	2%	55%	2%	55%
Northumbrian Water	22.7	26.4	31.8	19.3	14	19.3	14	27%	47%	27%	47%
Severn Trent Water	28.4	27.4	27.7	18.8	14	18.8	14	31%	49%	31%	49%
South West Water	31.4	31.7	41	20	16.5	20	15.8	37%	48%	37%	50%
Southern Water	26.9	22	33.1	18	14.7	18	13.7	18%	33%	18%	38%
Thames Water	42.4	34.6	30.4	22.8	15.4	20	14.2	34%	55%	42%	59%
United Utilities	62.1	44.2	46.6	26.4	18.7	26.4	17.7	40%	58%	40%	60%
Wessex Water	30.9	22.5	32	23.5	20	21.9	18.2	-4%	11%	3%	19%

⁷⁹ Yorkshire Water is the only company not to fully reflect its river water quality action plan commitment in its business plan.

^[4] Welsh companies did not commit to spill reductions in their river water quality action plan commitments.

⁸⁰ Storm overflow performance is reported on a calendar year rather than financial year. We use the data from 2025 to set PCLs for the 2025–26 period.

Yorkshire Water	32.4	35.9	38.3	30.7	20	26	17.6	14%	39%	27%	51%
Total	36.1	32.7	37.5	28.3	19.4	24.7	18	21%	41%	25%	45%
England	33.4	30.7	34.5	25.2	17	21.7	16	26%	45%	29%	48%
Wales	54.2	45.1	55.5	47.1	33.5	42.8	29.7	1%	26%	5%	34%

Table 16: Storm overflow spill frequencies per company and proposed PR24 solutions

	Total no. storm overflows listed in the annual return in 2021	Total no. storm overflows with EDM commissioned in 2021	% of storm overflows recorded 10 spills or less	Total number of storm overflows with >10 spills	Nr of storm overflows spill reduction schemes included in PR24
Anglian Water	1552	842	44%	467	198
Dŵr Cymru	2299	2295	35%	1498	166
Hafren Dyfrdwy	49	49	37%	31	15
Northumbrian Water	1567	1542	42%	890	239
Severn Trent Water	2658	2437	50%	1231	583
South West Water	1391	1102	36%	706	257
Southern Water	978	963	51%	469	246
Thames Water	465	465	34%	307	108
United Utilities	2192	2006	32%	1358	446
Wessex Water	1297	1049	42%	613	143
Yorkshire Water	2246	2178	35%	1408	483
Total	16694	14928	40%	8977	2884

Customers should not have to pay twice for storm overflow spill reductions.

Companies have provided Ofwat with assurance that the storm overflow proposals requested for enhancement investment meet current permit conditions, and any enhancement funding provided will not be used to regain permit compliance. Given the proposed large investment we do not want customers to pay twice for storm overflow improvements. To prevent this, we are requiring companies to demonstrate that:

- they are operating assets in compliance with their permits, funding for which has already been provided through base allowances;
- spills are not due to maintenance or operational issues; and
- the outcomes funded by previous enhancement expenditure, such as spill frequency targets, have been achieved.

We are including a condition to clawback funding in PR29 if these conditions cannot be demonstrated.

The table below shows a breakdown of the total allowance for storm overflow spill reduction schemes. It includes the grey/hybrid econometric modelling allowance (combined network and STW), flow to full treatment schemes that address spill frequency, green-only, wetland and other related storm overflow scheme allowances.

Table 17: Breakdown of proposed storm overflow spill reduction allowances

Company	Total no. SO spill reduction schemes	Grey/hybrid storage allowance (£m)	Storm overflow related FFT scheme allowance (£m)	Green Only scheme allowance (£m)	Wetland scheme allowance (£m)	Other storm overflow related allowance (£m)	Total SO spill reduction scheme allowance (£m)
Anglian Water	198	577	39	64	1	23	704
Dŵr Cymru	166	960	121	0	17	0	1097
Hafren Dyfrdwy	15	10	22	0	0	0	11
Northumbrian Water	239	1023	0	0	0	0	1023
Severn Trent Water	583	1481	0	93	0	0	1575
South West Water	257	612	68	19	3	7	709
Southern Water	246	775	0	1	183	53	1012
Thames Water	108	537	139	0	64	0	740
United Utilities	446	1850	179	1	0	236	2267
Wessex Water	143	359	35	19	102	0	515
Yorkshire Water	483	1383	77	0	4	1	1465
Total	2884	9567	680	198	373	320	11118

The table below the breakdown of the total storm overflow expenditure including monitoring. This comprises storm overflow spill reduction schemes, as well as Event Duration Monitors and Continuous Water Quality Monitors.

Table 18: Breakdown of proposed storm overflow allowances

Company	Total SO spill reduction scheme allowance (£m)	Total CWQM Allowance (£m)	Total EDM Allowance (£m)	Total Storm Overflow, inc. monitoring, allowance (£m)
Anglian Water	704.27	77.82	5.72	787.81
Dŵr Cymru	1,097.08	6.07	4.85	1,108.00
Hafren Dyfrdwy	11.34	0.00	0.00	11.34
Northumbrian Water	1,022.90	51.97	0.00	1,074.87
Severn Trent Water	1,574.53	133.25	0.43	1,708.21
South West Water	708.70	54.50	1.13	764.33
Southern Water	1,011.55	40.51	7.66	1,059.72
Thames Water	740.32	41.84	1.64	783.81
United Utilities	2,410.39	84.35	2.65	2,497.39

Company	Total SO spill reduction scheme allowance (£m)	Total CWQM Allowance (£m)	Total EDM Allowance (£m)	Total Storm Overflow, inc. monitoring, allowance (£m)
Wessex Water	515.32	62.63	22.12	580.06
Yorkshire Water	1,465.39	97.49	1.28	1,564.75
Total	11,262.79	651.02	27.47	11,940.28

3.3.3 Nutrients – phosphorus and total nitrogen removal

Nutrient pollution is detrimental to the environment because it can lead to eutrophication in our rivers, lakes, and estuaries by stimulating algal and aquatic plant growth that depletes dissolved oxygen. For inland waterways phosphorus is the main nutrient contributing to eutrophication. Nitrogen can contribute to freshwater eutrophication in some situations, particularly in lakes. However, in saline waters, nitrogen is usually the key nutrient involved in eutrophication. This disrupts natural ecosystems including wildlife and can lead to waterbodies falling into 'unfavourable condition'. Nutrient pollution (particularly phosphorus and nitrogen) originates from several different sources, particularly agricultural pollution and effluent discharged from wastewater treatment works^{81,82}.

For PR24, companies have proposed £6.9 billion of expenditure for the reduction of nutrients; combined phosphorus and total nitrogen. This is more than double the combined allowance for PR19 of £3.1 billion for nutrients (99.4% was for phosphorus), when phosphorus removal was the single largest area of enhancement costs. For PR24, companies have proposed expenditure of £5.8 billion for phosphorus reduction alone which is a reduction compared to the PR24 business plan request at draft determination of £6.2 billion.

At draft determination, there remained outstanding policy and technical decisions, meaning there were further amendments to the WINEP after draft determinations had been made. This included, but was not limited to, alternative proposals by water companies to meet the requirements introduced by the Levelling Up and Regeneration Act (LURA). This means that there have been several changes in our assessment since draft determination to enable companies to comply with their legal obligations under LURA following the post draft determination decisions made by Defra.

⁸¹ Environment Agency, '[Phosphorus and Freshwater Eutrophication Pressure](#)', October 2019. 'Phosphorus and Freshwater Eutrophication Pressure', October 2019. Figure 6 states that 60-80% of the Phosphorus load discharged to English rivers is from sewage treatment works element, but this proportion is decreasing. 20-30% of the Phosphorus load is from agricultural sources, but this proportion may be as high as 50% by 2027

⁸² Environment Agency, '[State of the water environment indicator B3: supporting evidence](#) - GOV.UK (www.gov.uk)', October 2022. States that 36% of water bodies are affected by pollution from wastewater and 40% by agricultural pollution from rural areas.

What we said in our draft determinations

Our PR24 draft determinations were based on the latest available information from the companies' Water Industry National Environment Programme (WINEP) and National Environment Programme (NEP).

Phosphorus removal: We assessed expenditure using scheme level econometric modelling that utilised several cost drivers including population equivalent (thousands) served, historical phosphorus (P) consent levels (in mg/l), enhanced P consent levels (in mg/l) and whether schemes need to meet the technically achievable limit (TAL) levels or less ($\leq 0.25\text{mg/l}$). We triangulated between historical and forecast models to achieve a balanced view of allowances.

Total nitrogen removal: We assessed expenditure through technical deep dives as econometric modelling was not feasible due to only four companies submitting expenditure requests under this line.

Nitrogen Technically Achievable Limit (N-TAL): We assessed expenditure requested under N-TAL investigations cost line through shallow dive due to low materiality.

Catchment and nature-based solutions: We assessed expenditure through a combination of technical deep dives and shallow dives depending on materiality. Econometric modelling was not feasible due to a low number of companies submitting expenditure requests under the specific cost lines. We encouraged companies to consider the use of catchment and nature-based solutions (C&NBS) where possible, but we also recognised that the use of these solutions is not permitted under all WINEP/NEP drivers for removal of nutrients.

Stakeholders' representations

Phosphorus removal: The representations made for phosphorus removal can be broadly categorised into the following areas.

Use of historical data: The key issues for all companies that made representations was the use of historical data and the degree to which it can explain costs for PR24 schemes. Companies did not agree with the 50:50 weighting we placed on the triangulation of the historical and forecast models. Southern Water, Thames Water and Wessex Water proposed that no weighting at all be placed on the historical costs models. South West Water proposed a weighting of only one-third be placed on the historical costs models. Severn Trent Water and United Utilities proposed a weighting of even less, only one-quarter, be placed on the historical costs models. Yorkshire Water agreed with our approach but did suggest a lower weighting be placed on the historical costs models.

All companies' representations mentioned the relatively poorer model performance of the historical models. Severn Trent Water, South West Water and United Utilities stated that one

of the key reasons for the poor historical costs models performance is that the PR24 programme has a lot more small sites with strict permits being upgraded. This leads to a higher efficient cost at these sites that was not captured well by the models, they said. Thames Water stated that the historical cost models do not perform as well as they do not account for increasing supply chain constraints.

Use of Population Equivalent served: Severn Trent, Southern Water, South West Water, Thames Water and United Utilities all stated the use of design population equivalent (PE)⁸³ is more representative of the costs incurred than PE served which is used in the historical and forecast phosphorus removal models.

Post modelling adjustment and application of reconciliation adjustment factor: Severn Trent Water, Southern Water and South West Water supported the modelling of data up to 2029-30 only and dealing with schemes with a significant post-2030 totex separately.

Other: Wessex Water highlighted an error in the cost allocation in Anglian Water's data relating to an unmodelled line for effluent monitors. Thames Water stated our models overestimate the extent to which historical permits reduce efficient costs. United Utilities stated the model does not account for the biological phosphorus removal solutions being higher cost. Wessex Water stated that for sites without existing phosphorus limits, suspended solids permit limits could be considered as a cost driver. The Environment Agency said it would like to see separate assessments for chemical and biological phosphorus removal options, as it was concerned that our approach could limit innovation for biological treatment options where these can support sustainability, flexibility and resilience of chemical supply.

Total nitrogen removal: Companies on the whole agreed with our approach for assessing total nitrogen removal expenditure.

The Environment Agency recognised that, due to timing, Ofwat had based its draft determinations assuming that companies proposed variations would meet the requirements introduced by the Levelling Up and Regeneration Act (LURA). It requested that final determinations should reflect decisions on amendments made by Defra to enable water companies to comply with their legal obligations.

Catchment and nature-based solutions: Three stakeholders submitted representations on multi-benefit catchment and nature-based solutions. The Wildlife Trusts, The Royal Society for the Protection of Birds (RSPB) and The Wildlife and Countryside Link (Link) all expressed

⁸³Defra, [Wastewater treatment in England](#), "Population equivalent (PE) is a unit of measure used in the Urban Wastewater Treatment Directive (UWWTD) for assessing the polluting potential of wastewater discharges". Under UWWTD, sensitive area qualifying discharge designations, companies submit growth horizon predictions to the Environment Agency. There is not a consistent methodology used by companies, meaning variation may occur depending on how they account for trade and tourism figures, and LPA growth allocations and certainty.

concern around the proportion of spend allocated for catchment and nature-based solutions (see section 4.3 for further detail).

The Environment Agency stated that it is reviewing its catchment nutrient balancing (CNB) policy and is progressing this through its internal decision process.

Our assessment and reasons

Phosphorus removal:

Use of historical data: We recognise there are some differences in the type of schemes between PR19 and PR24. For example, smaller schemes receiving tighter permits on average. This is why we only set a 50% weight on the historical cost models. If there were no differences, we would have set a higher weight on historical data than 50%. We have made model improvements, including treating optimisation schemes with enhanced permits (i.e. those set at a level higher than 2mg/l) separately and new scheme level transfers models.

Use of PE served: We have tested the use of design PE within our models in place of PE served. We do not agree with company representations that this is more appropriate. The advantage of using PE served is that it treats all companies and schemes the same because it does not matter what design standard has been used. We have engaged with the Environment Agency, who confirmed that there is no standard for the calculation of design PE as this could lead to inconsistent treatment between companies.

Post modelling adjustment and application of reconciliation adjustment factor: We have updated models to drop schemes with post-2030 totex. This only affected a small number of very large schemes which are outliers and were already excluded from the model.

Other: We asked Anglian Water to resubmit cost data to include the cost for effluent monitors within each scheme line. We recognise that costs for biological phosphorus (P) removal solutions could be higher than chemical P removal solutions. Therefore, we treat these schemes as engineering outliers and provide them with an efficiency challenge. Similarly, we treat schemes that have an enhanced permit limit of below the technically achievable limit (TAL) as engineering outliers.

Total nitrogen removal: Given broad support we maintain our position on nitrogen removal. We have updated our assessment for final determination to reflect Levelling Up and Regeneration Act (LURA) to reflect the decisions made by Defra.

Catchment and nature-based solutions: We continue to support catchment and nature-based solutions where they are deemed to be acceptable by the Environment Agency. However, given that the Environment Agency is reviewing its catchment nutrient balancing (CNB) policy, we have considered mechanisms to ensure that alternative options can be delivered if these schemes are no longer supported.

Should catchment nutrient balancing no longer be supported by the Environment Agency, we will allow the previously funded catchment nutrient balancing schemes to be replaced with phosphorus removal schemes. The allowances for the new schemes will be determined based on the phosphorus model. The allowances for the new schemes will be determined based on the phosphorus model, and any costs over and above existing catchment nutrient balancing allowances will be trued up at the end of the period subject to companies having spent in full their allowances for both catchment nutrient balancing and phosphorus removal.

Our final determination

Phosphorus removal: This accounts for £5.8 billion of the requested expenditure. Our overall approach for final determination has broadly remained the same as at draft determination. We assessed this expenditure using scheme level econometric modelling that utilised population equivalent served (thousands), historical P consent (mg/l), enhanced P consent (mg/l), and whether schemes need to meet the technically achievable limit (TAL) or less (≤ 0.25 mg/l). We have triangulated historical and forecast models to achieve a balanced view of allowances. Allowances are lower when using the historical cost models. This may be because of the prevalence of a larger WINEP/NEP programme at PR24, which may come with deliverability challenges, or companies submitting high business plan forecasts due to uncertainty. This leads to an efficiency challenge to proposals of 15% at the sector level, but with substantial variation between companies. For example, the proposals of Anglian Water, Dŵr Cymru, Hafren Dyfrdwy, Northumbrian Water, Southern Water and Yorkshire Water appear efficient. Whereas those of Severn Trent, South West Water, Thames Water and Wessex Water and United Utilities appear inefficient. Further details are provided in 'PR24 draft determinations: Expenditure allowances – Enhancement cost modelling appendix'.

Windermere

We approved four storm overflow schemes related to improvements in the Windermere catchment as part of the accelerated infrastructure programme. At draft determination United Utilities also included a bespoke performance commitment aimed at incentivising partnership working to reduce the impact from third parties on Lake Windermere by reducing phosphorus pollution (further details on the bespoke performance commitment are included within the outcomes appendix).

In response to the draft determination, we received representations from various local stakeholders and environmental NGOs. These contained a range of views, including those that want to see more action on water quality in national parks, including greater expenditure from United Utilities on its own infrastructure. We also received over a thousand emails from residents and visitors who shared their memories and experiences of the lake and their support for the aims of the Save Windemere Campaign. They expressed their concern that the general public had not been able to provide informed opinions because of the lack of transparency over the ongoing investigations into United Utilities' impact on Lake Windermere. They suggested that all investment is halted until such

matters are resolved and made transparent. Some respondents also raised concerns over existing compliance, and stated that customers should not have to pay for compliance-related investment.

Since draft determination United Utilities has requested funding for 12 additional schemes related to Lake Windermere at a total cost of £186.4m. These relate to changes to deliverables in the latest WINEP received from the Environment Agency, and include schemes to further reduce phosphorus from nine final effluent discharges and reduce spills from three storm overflows that discharge into the Windermere catchment.

The company requested that these schemes be included in the large scheme gated process because of uncertainty in their scope, cost and deliverability arising from the late inclusion of these schemes in the WINEP.

On Save Windermere Campaign's concern, we understand that the Environment Agency has responded to the concerns related to its modelling.

As to stakeholder concerns about the ongoing investigation into the company's assets, it is not possible for us to comment without pre-judging the findings of the investigation, save to say that all enhancement allowances for storm overflows are conditional on the company giving satisfactory evidence that funding is only for the functioning of the asset beyond permit compliance, and that funding for phosphorus removal is only to meet stricter permit requirements.

We support United Utilities proposal to include the 12 additional schemes in a gated process, as this allows the scope to be more clearly developed and defined before committing to funding the enhancement expenditure.

For final determination we continue to provide expenditure allowances for the four accelerated infrastructure schemes, while including the remaining 12 additional schemes within the gated process. We will continue to engage closely with both United Utilities and the Environment Agency throughout the development of this programme. Details of the four accelerated infrastructure schemes are set out alongside other storm overflow schemes in the price control deliverables.

Total nitrogen removal: This covers £781 million of the requested expenditure. Our approach for final determination has remained the same as at draft determination. Expenditure for total nitrogen removal has been assessed through technical deep dives.

Due to changes in legislation introduced by the Levelling Up and Regeneration Act (LURA), companies have made scope changes to their total nitrogen removal programme.

Northumbrian Water has requested expenditure in this cost line for only one new scheme to install a long sea outfall (LSO) at Bran Sands, totalling £246 million.

Bran Sands Long Sea Outfall

Northumbrian Water proposed in its representation for the Bran Sands scheme to be given an allowance through enhanced engagement and cost sharing. While we acknowledge that the scheme may be developed to stage gates one and two (according to the requirements of our large-scheme gated process, see section 4.7.3), there remains a high level of uncertainty around scope and delivery. Notably, that the outstanding permits and operation agreements will pose risks to the route being used to lay the pipework.

Northumbrian Water stated it will begin detailed design, costing and planning applications (stage gate three in our large-scheme gated process) in early 2025. We are allowing some flexibility for this scheme to accelerate the large scheme gated process submission dates. We will require at least two months' notice from the company for the proposed submission date, including a letter of support from the relevant regulator for the proposed solution.

Furthermore, we are allowing 12% of the scheme cost to be used as development allowance. This is twice the assumed amount for development allowance because we recognise the high upfront costs associated with a scheme of this nature.

N-TAL: We maintain our approach for N-TAL investigations, where companies will receive a shallow dive efficiency challenge due to low materiality. This covers £76 million of the requested expenditure.

Catchment and nature-based solutions: This covers £270 million of the requested expenditure and includes nutrient balancing, catchment permitting and nature-based solutions. Due to the low numbers of companies proposing investment under these specific cost lines, this investment was assessed through a combination of deep dives and shallow dives depending on materiality.

There is uncertainty around the Environment Agency's continued support for catchment nutrient balancing. We have taken this into consideration when completing our assessment of catchment nutrient balancing expenditure. Catchment nutrient balancing is where sewage treatment works permit requirements are offset by companies paying other polluters (for example, farmers) to reduce nutrients through better management of their land and waste. Recent proposed changes, such as the Farming Rules for Water and the Environment Act target of 40% reduction in phosphorus for farmers, make clearer the responsibilities in this area of farmers and of water and sewerage companies. We support catchment nutrient balancing and are keen to continue to set expenditure allowances for proposals approved by the Environment Agency or National Resource Wales as part of company WINEP/NEPs.

While we encourage companies to consider the use of catchment and nature-based solutions (C&NbS) where possible, we recognise that the use of these solutions is not permitted by the Environment Agency and National Resources Wales under all WINEP/NEP drivers for removal of nutrients. Some companies are also not permitted to use catchment nutrient balancing or catchment permitting solutions because their current environmental performance rating (EPR) is too low. With all innovative permitting approaches, the companies remain responsible for ensuring that if the innovative solution is not effective at achieving the required targets, then an alternative solution must be implemented as soon as practicable. This may include reverting to grey solutions.

Should catchment nutrient balancing no longer be supported by the Environment Agency, we will allow the previously funded catchment nutrient balancing schemes to be replaced with phosphorus removal schemes. The allowances for the new schemes will be determined based on the phosphorus model. The allowances for the new schemes will be determined based on the phosphorus model, and any costs over and above existing catchment nutrient balancing allowances will be trued up at the end of the period subject to companies having spent in full their allowances for both catchment nutrient balancing and phosphorus removal.

We recognise that generally catchment and nature-based solutions are unlikely to be viable for tighter phosphorus permits such as those below 1mg/l, or to meet phosphorus requirements at larger sites. We are pleased that some companies have proposed investment for catchment and nature-based solutions, both as a whole solution or a hybrid combined with conventional approaches.

The investment requested and allowances by company are shown in the table below. Overall, we apply an 15% cost challenge to traditional/combined investment, and a lower 8% cost challenge to catchment and nature-based solutions.

Table 19: Nutrients investment request vs. allowance

Company	Traditional / Combined Solution Allowance (£m)		Catchment and Nature Based Solutions Allowance (£m)	Total Allowance (£m)
	Phosphorus	Nitrogen		
Anglian Water	952.34	71.32	24.37	1,048.03
Dŵr Cymru	164.41	0.25	19.75	184.41
Hafren Dyfrdwy	8.02	0.00	0.00	8.02
Northumbrian Water	25.15	250.69	111.28	387.12
Severn Trent Water	544.17	30.86	30.09	605.12
South West Water	110.75	1.94	37.49	150.18
Southern Water	377.22	237.36	12.40	626.97
Thames Water	1,219.04	16.19	2.15	1,237.38
United Utilities	529.93	3.43	5.86	539.22
Wessex Water	630.30	186.76	2.89	819.94

Company	Traditional / Combined Solution Allowance (£m)		Catchment and Nature Based Solutions Allowance (£m)	Total Allowance (£m)
	Phosphorus	Nitrogen		
Yorkshire Water	356.73	0.04	3.61	360.39
Total	4,918.05	798.83	249.90	5966.78

3.3.4 Wastewater WINEP/NEP Other

In addition to enhancement expenditure on storm overflows and nutrients there is a broad range of other wastewater improvements included in the WINEP/NEP. Many of these are linked to the core legislative obligations detailed elsewhere, particularly the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 and the Conservation of Habitats and Species Regulations 2017. For example, WINEP/NEP obligations for sanitary determinands removal and chemicals are linked to these obligations and requirements to improve quality or prevent deterioration of UK waterbodies. The term sanitary determinands refers to substances like ammonia or suspended solids that make up an effluent, or to the numeric limits in water on things like biochemical oxygen demand (the amount of dissolved oxygen consumed by bacteria in water growing on those substances).

A range of investigations are required under WINEP/NEP, including for chemicals investigations relating to the continuation of the national Chemical Investigations Programme which will further increase data and knowledge building on previous Chemical Investigations programmes. For PR24, the WINEP and NEP both include a new driver specific to microplastics investigation. In addition, there are 'investigation' or 'no deterioration investigation' ⁸⁴WINEP/NEP driver codes for Bathing Waters, 25-year environment plan, Habitats Directive, Marine Conservation Zones in England and Marine Water Quality in Wales, Natural Environment and Rural Community Act 2006 (NERC), Water Framework Directive, Nitrogen technically achievable limit and Sites of Special Scientific Interest.

The largest programme of WINEP/NEP investigations relates to storm overflows. These are required to determine the scope of works required to ensure no local adverse ecological input. Storm overflow investigations must be concluded by 30 April 2027 in England and 31 March 2027 in Wales and will inform the requirements for storm overflow improvement actions.

There are requirements for marine conservation zones, shellfish waters and bathing waters to achieve improvements or prevent deterioration for designated areas.

What we said in our draft determinations

⁸⁴ Related to preventing deterioration in waterbody quality

For bathing waters specifically, designations of new bathing waters were made by Defra and Welsh Government in May 2024. We recognised that these new designations may not therefore be reflected in all the company WINEPs/NEPs issued by the Environment Agency or National Resources Wales in September 2023. We asked companies to include costed plans to meet new designations reflected in their WINEP/NEP in response to the draft determination so that we could consider proposed expenditure for final determination.

Stakeholders' representations

Bathing Waters /microbiological treatment – In their representations, Severn Trent Water, and Yorkshire Water increased their cost requests because of new designated bathing waters. Anglian Water also increased its cost request from £34 million to £195 million, because of increased scope, and its more stringent interpretation of treatment guidance.

Chemicals removal – In their representations, Anglian Water and Severn Trent Water stated that the single cost driver utilised in the modelled approach was overly simplistic and not representative of the schemes proposed. Northumbrian Water stated that there was a rounding error within the model that was impacting all allowances, as well as stating that Severn Trent Water's costs were disproportionately affecting the modelled allowances.

Chemical investigations – In their representations, companies and the Environment Agency confirmed that the Chemicals Investigation Programme (CIP) has 11 national UKWIR-led projects which already have the full budget committed and tendering underway, and so these should be excluded from any efficiency challenges.

Sanitary determinands – In their representations, Dŵr Cymru, South West Water and Wessex Water all proposed that the company level modelling was unsuitable and did not adequately account for scheme level differences such as scheme size. Scheme level modelling was proposed as a more suitable approach.

Investigations – There were significant representations in this area, with companies generally challenging the deep dive approach taken. There were also some large changes in cost requests between original business plan data and company representations; Anglian Water, Severn Trent Water, United Utilities and Yorkshire Water all increased their cost requests. However, Northumbrian Water, Thames Water and Wessex Water all reduced theirs.

The remaining drivers of investment under WINEP/NEP are described at individual investment line level, along with our assessment approach, within 'PR24 final determinations: Expenditure allowances – Enhancement cost modelling appendix'.

Our assessment and reasons

Bathing Waters /microbiological treatment – Due to uncertainty around the significant cost request increase from Anglian Water, we have undertaken a deep dive assessment and engaged extensively with the Environment Agency.

Chemicals removal – We acknowledge the limitations with the modelling approach at draft determination, and accept Northumbrian Water's representation on rounding and remove any rounding from the model. We acknowledge that Severn Trent's data heavily skewed the model, as did Thames Water's previously, but note that removal of Severn Trent leads to skewing by Anglian Water, and removal of both companies, in addition to Thames Water leads to an insufficient number of data points. As the model revisions give the majority of companies close to their full request, and there were remaining limitations, we have removed the modelled approach, and applied a deep dive / shallow dive approach, giving companies that are efficient against the indicative benchmark their full request, and undertaking a deep dive of companies that are inefficient against the indicative benchmark (Thames Water and Anglian Water).

Chemical investigations – We agree with the representations from United Utilities that the application of a shallow dive efficiency challenge across all companies was not suitable for this cost line, due to a significant portion of the costs already being agreed and set with UK Water Industry Research. Due to the significant cost request from Anglian Water, we retained a deep dive approach and partially accept the new evidence provided in its representations.

Sanitary determinands – We agree with representations from Dŵr Cymru, South West Water and Wessex Water that the company level modelling had limitations in terms of accounting for scheme level differences such as scheme size. We have revised our approach to utilise both a scheme level model and a company level model, with a median efficiency challenge. PE served was retained as a cost driver, with the scheme level modelling able to capture scheme level differences more effectively than the company level modelling did at draft determinations. We also identified engineering outliers based upon permit stringency and assessed these separately to the modelled schemes.

Investigations – We have taken note of the significant representations in this cost area, and have had ongoing discussions with the Environment Agency and companies over the allocation of investigations between different complexity categories. While some companies made reasonable estimates of the percentage of investigations likely to be within lower complexity categories, others maintained that all investigations would be complex. The Environment Agency was unable to express a view as to what proportion of investigations should be allocated to each category under the revised investigation guidance.

Given the combined risk of over/underfunding companies, we have fully funded company requested allowances but adjust the cost sharing rates to 40:10 to ensure that customers do not overpay should the investment not be required, while retaining some protection should companies incur higher costs.

Our final determination

Bathing Waters /microbiological treatment – For final determination we maintain the draft determination approach of assessing the cost line using a deep dive / shallow dive approach.

Anglian Water has been assessed through a deep dive approach due to the significant expenditure and justification for the change between original business plans and company representations.

Severn Trent Water has been assessed through a shallow dive approach but it should be noted that a significant portion of this expenditure has been assessed separately as a development allowance for large gated schemes.

Chemicals removal – For final determination we assess this cost line using a shallow dive approach for all companies, aside from Severn Trent Water and Thames Water. The shallow dive approach was more suitable than the modelled approach utilised at draft determinations due to the range in scope proposed by companies in this cost line.

Additional evidence provided by Severn Trent Water and Thames water has been used to inform a deep dive assessment. These companies were selected for deep dive based upon size of scope compared to other companies.

Chemical investigations – For final determination we assess this cost line using a deep dive / shallow dive approach, but remove the shallow dive efficiency challenge.

We continue to assess Anglian Water through a deep dive approach.

Sanitary determinands – For final determination we assess this cost line using combination of scheme level and company level modelling. Equal weighting was applied to both scheme level and company level models, and we apply a median efficiency challenge.

Investigations – For final determination we are allowing companies requested costs in full. We adjust the standard cost sharing rate to 40:10.

3.3.5 Advanced WINEP (A-WINEP)

The Advanced WINEP (A-WINEP) is an initiative which invited companies in England to propose innovative approaches that were not possible under the current WINEP methodology. They aim to achieve better outcomes for customers, the environment and will inform approaches for future WINEPs. Two water and sewerage companies (Anglian Water and United Utilities) are progressing wastewater related A-WINEP projects. South East Water is also progressing an A-WINEP project aimed at reducing nitrate run off.

What we said in our draft determinations

Anglian Water requested £26.3 million to create a Partnership Centre of Excellence that will bring together stakeholders including the water industry, NGOs, and local government to deliver improvements in river and coastal waters through nature-first solutions. While we did not propose an efficiency challenge for Anglian Water, it did receive an adjustment to the requested expenditure because of the WINEP capping adjustment made after the assessment process, which resulted in allowances of £24 million being proposed.

United Utilities requested £231 million to deliver 57,796m³ of equivalent storage avoided⁸⁵ on overflows requiring improvement under the Storm Overflows Discharge Reduction Plan, through interventions including rainwater gardens, swales, permeable paving and natural flood risk management. In addition to the enhancement investment, £50m will be leveraged through partnership funding. We approved the total allowance requested in full.

Stakeholders' representations

In response to the draft determination, Anglian Water made a representation requesting that the WINEP capping adjustment should be updated and that the totex of £26.3 million requested be maintained.

United Utilities requested that Ofwat provide a definition for 'non-storage solutions', remove the requirement to run hydraulic models for 'non storage solutions' to improve flexibility when working with partners, and proposed its own methodology for calculating conventional storage avoided.

Our assessment and reasons

As the A-WINEP is targeted at innovative approaches and learning to support future AMP investments, we want to minimise regulatory barriers. Therefore, we accept United Utilities request to remove the requirement to run hydraulic models when developing 'non-storage' solutions, on the basis that this allows greater flexibility when developing solutions and engaging with partnerships. We have also accepted the company's methodology for calculating conventional storage avoided on the basis that this is a standalone programme that does not need to follow the wider storm overflow programme approach.

Our final determination

For final determinations we are proposing to allow the full requested allowance of £26.3 million for Anglian Water's A-WINEP proposal. This is due to the WINEP capping adjustment for Anglian Water no longer being applied.

⁸⁵ Equivalent storage avoided is the amount of grey (eg. concrete) storage that would be required to reduce storm overflow spills if alternative solutions (eg. catchment and nature based solutions) were not constructed.

For final determinations, we propose to provide the full allowance for United Utilities' requested £231 million to deliver 57,796m³ of equivalent storage avoided⁸⁶ on overflows requiring improvement under the Storm Overflows Discharge Reduction Plan. This equivalent storage avoided has been agreed to be delivered through interventions including rainwater gardens, swales, permeable paving and natural flood risk management. We are continuing to accept United Utilities' proposal to have a PCD that enables agile delivery.

We continue to allow costs in full to provide an opportunity to deliver better outcomes for customers, the environment and to inform approaches for future WINEPs in key investment areas.

3.3.6 Water WINEP/NEP

Water services WINEP/NEP actions primarily seek to address hydro-morphological related issues – the physical character and water content of water bodies. This normally results in reducing abstraction of water from the environment or physical and habitat improvements. The companies' obligations reflect environmental legislation, such as Water Environment (Water Framework Directive) Regulations, Eels Regulations, and Conservation of Habitats and Species Regulations, and duties of protected areas conservation and biodiversity enhancement.

A significant amount of WINEP delivery (in particular against the Water Framework Directive driver) is funded as part of WRMP related investment. Abstraction reductions, or changes to flow regimes are identified, and where these impact on the company supply-demand balance in drought conditions, result in investment being justified via the WRMP. Spend in these areas gets reported against supply-demand balance and metering enhancement, and not under the WINEP.

We asked companies to submit their proposed expenditure against twelve standardised water WINEP/NEP enhancement areas:

- Biodiversity and conservation;
- Eels/fish entrainment screens;
- Eels/fish passes;
- Invasive Non-Native Species;
- Drinking Water Protected Areas;
- Water Framework Directive;
- Wetland creation;
- Trade effluent discharge flow monitoring;
- 25-year environment plan;
- Investigations – desk based study only;

⁸⁶ Equivalent storage avoided is the amount of grey (e.g. concrete) storage that would be required to reduce storm overflow spills if alternative solutions (e.g. catchment and nature-based solutions) were not constructed.

- Investigations – survey, monitoring or simple modelling; and
- Investigations – multiple surveys, and/or monitoring locations, and/or complex modelling.

What we said in our draft determinations

In the draft determination we followed a risk-based process and proposed an allowance of £881 million for water WINEP/ NEP enhancement investment across the industry. This was an increase from PR19 final determination which allowed companies £745 million for this area of enhancement.

In the draft determination we validated all companies' requests against the agreed WINEP/ NEP. We used a combination of unit cost benchmarking, shallow dive assessments and deep dive assessments to set allowances.

WINEP Investigations was a key area where we set allowances based on a unit cost benchmark in the draft determination. We assessed the investment for this line using a combination of unit cost benchmarking and outlier deep dive assessments to confirm model outputs. Assessment of costs was based on the triangulation of industry unit-cost benchmarking and WINEP group (driver) benchmarking. For one company an outlier deep dive was completed to determine whether compelling econometric or engineering evidence had been provided to justify the higher costs presented for its WINEP Investigations programme. We tested other cost drivers as part of our draft determination development, such as investigation complexity. This approach was found to be unsuitable, potentially due to the misallocation of investigations between categories.

For low materiality costs assessed via a shallow dive approach, in our draft determination, we allowed the requests after applying a 'company specific shallow dive efficiency factor' set between 0% and 20%.

Stakeholders' representations

We received no representation from Hafren Dyfrdwy, Dŵr Cymru, Portsmouth Water and South Staffs Water on the water WINEP/ NEP cost allowances. Companies' representations that we did receive on water WINEP/ NEP can broadly be categorised into the following areas.

Shallow dive company specific efficiency factor: Companies receiving the highest efficiency challenge (up to 20%) challenged this and asked for it to be reconsidered. SES Water and Wessex Water asked for the cap to be reduced from 20% to 10% as it was at PR19.

In contrast, Affinity Water accepted its draft determination company specific efficiency challenge across its water WINEP programme and reduced its totex request accordingly for the final determination.

Funding impact on delivering statutory WINEP/NEP: In general companies reiterated that delivery of WINEP/NEP investments addresses statutory obligations and most asked to reinstate the allowances to full requested funding.

Some companies increased their proposed investment on water WINEP/ NEP as a result of additional actions now included in WINEP/ NEP for delivery during 2025-2030.

Additional evidence for deep dives: Companies provided some specific feedback in representations on points raised in our draft determination deep dive assessments. We summarise these and respond to evidence provided in representations in our deep dive assessments for final determination. These can be found within the enhancement models for each individual WINEP/ NEP area.

Most of the company representations revolve around the Water Framework Directive (WFD) and water investigations enhancement areas.

Water Framework Directive (WFD): Affinity Water and Severn Trent Water, which proposed the biggest investment programmes, did not accept our challenges and requested full allowances aligned with the original business plan submissions in October 2023. Severn Trent Water believed that the need for investment is clear and statutory, that all the costs in its plan are enhancement expenditure, are cost efficient and will deliver the best solution for customers. Affinity Water stated there is now a step change in the configuration and capacity of assets needed to meet its supply-demand balance while accommodating new obligations such as sustainability reductions. Both companies responded to our draft determination challenges by providing additional evidence against our deep dive assessment comments.

In its representation, Thames Water increased its requested investment for its WFD programme. The company challenged the reduction in allowance for the 'Netley WTW' scheme, applied on the grounds that it has already been partially funded in the 2020-2025 period to increase resilience in the Guildford Water Resource Zone. Thames Water provided a revised scheme scope for the 'Netley WTW' WFD scheme, which clarified that the company's intent is to increase the scope of the currently incomplete 'Shalford to Netley Mill' supply-side scheme, funded in the 2020-2025 period, to a dual-main approach.

Water WINEP investigations: Companies' representations on investigations can broadly be categorised into the following areas.

- **Investigation line complexity (desk-based, simple and complex):** Five⁸⁷ companies stated that a median unit-rate disadvantaged programmes where the majority of investigations were more complex.
- **Geographical scale:** Five⁸⁸ companies highlighted that investigations vary widely in geographical scale, and that those investigations which covered multiple catchments or

⁸⁷ South East Water, Southern Water, Wessex Water, Affinity Water and Severn Trent Water.

⁸⁸ South East Water, United Utilities, Wessex Water, Affinity Water and Severn Trent Water.

company-wide regions presented higher costs and were therefore more likely to receive efficiency adjustments.

- **WINEP action components:** Seven⁸⁹ companies stated that the model provides an allocation for the completion of 'WINEP Actions' but does not account for separate investigations included under 'WINEP Action Components' in the company's WINEP. WINEP actions with components therefore received an insufficient allowance for the number of investigations to be completed, they said.
- **'Grouped' investigations:** Anglian Water and Thames Water highlighted cases where singular WINEP Actions were 'grouped' and therefore representative of multiple investigations. In these cases, companies have made formal requests to the Environment Agency since the draft determination to adjust the number of 'Actions' or 'Action Components' so that these actions may be more accurately modelled.
- **Invasive Non-Native Species (INNS) Raw Water Transfer Biosecurity schemes:** The Environment Agency highlighted that multiple companies presented investment for investigations as part of an £5 million cross-industry collaborative investigation into the technologies, options, and issues identified for the improvement of Raw Water Transfer biosecurity. Each company's proportion of the costs was determined prior to the PR24 business plan submission using the Water UK funding model, which based allowances on a company's population density. The Environment Agency requested the full reinstatement of allowances in the case where adjustments have been made.
- **Other points raised in Investigations representations:** In representations on the draft determination, multiple companies updated the proposed investments and categorisations of water investigations. This is as a result of feedback from the Environment Agency, or due to the addition or removal of actions included in the WINEP/NEP for the 2025 to 2030 period. Companies also provided feedback on individual investigations which received adjustments. Several companies requested that either further analysis, or a deep dive approach, be applied.

We also received feedback from non-water company stakeholders. These are summarised as follows:

- The RSPB requested that we reconsider the £92 million reduction applied to the WINEP Biodiversity and Conservation programme.
- Blueprint for Water highlighted concerns that spend in key environmental areas, such as Water Framework Directive, was too harshly challenged.
- Natural England stated that it would like to see all the investigation and improvement projects under biodiversity and nature recovery drivers in the WINEP funded.
- The Environment Agency highlighted that benchmarking must account for the bespoke nature of some WINEP interventions, for example, schemes to improve fish passage and drinking water catchment schemes.
- Water Resources East (WRE) highlighted and challenged cost allowances for Anglian Water's and Essex & Suffolk Water's environment programmes, specifically on

⁸⁹ Anglian Water, South East Water, Thames Water, Southern Water, South West Water, Wessex Water and Affinity Water.

Environmental Destination investigations and Habitats Regulations compensatory measures.

- Westcountry Rivers Trust highlighted the efficiency challenges applied to South West Water's Drinking Water Protected Areas and Invasive Non-Native Species investment on need and best option and suggested these challenges be removed.

Our assessment and reasons

Deep dives and shallow dive company specific efficiency factor

Where we assessed the proposed investment using the deep dive approach in our draft determination, companies have largely improved the quality and availability of evidence in representations. For the deep dive assessments, we consider the availability and quality of evidence the company provides. In our draft determination we challenged companies' costs in our deep dives where there was a lack of evidence. For the final determination we adjust our allowances where the company has provided further evidence in its representation. This has led to an increase in the overall allowance for the water WINEP/NEP, including enhancement areas such as Biodiversity and Conservation (raised by the RSPB and WRE), Investigations (raised by WRE), Invasive Non-Native Species and Drinking Water Protected Areas (raised by the Westcountry Rivers Trust), and Water Framework Directive (raised by Blueprint for Water).

We continue to apply our company specific efficiency factor to any costs that we shallow dive. Since the draft determination we have continued to refine the company specific efficiency factor. As a result, at final determination, our shallow dive company specific efficiency factor has reduced. This has led to an increase in the overall allowance for the water WINEP/ NEP.

Impact on delivering statutory WINEP

In the final determination we provide companies with expenditure allowances to deliver all statutory and non-statutory WINEP and NEP obligations. We expect all companies to complete their agreed WINEP/NEP actions in full.

In response to the concerns raised by companies and non-water company stakeholders such as Natural England, we confirm that we allow efficient expenditure for companies to deliver their WINEP/NEP.

Companies are either funded through the enhancement allowance topped up by the implicit base allowances or were funded at PR19. Where reductions are made for base or previous funding this is because the company has been funded in full for this activity. It would not be appropriate or fair to customers to pay a company twice for the same activity or outcome.

Water Framework Directive

Section 3.5 provides further detail concerning our obligations in relation to the Water Framework Directive. In response to the concerns raised by Affinity Water, Severn Trent Water and Thames Water we reduce the draft determination efficiency challenge for the final determination. We retain some cost challenge because we still have minor concerns for all three companies, primarily regarding overlap with activities funded through base allowances and that alternative, and significantly cheaper solutions could be delivered (for example, through optimising current assets to abstract less rather than the proposed new infrastructure).

Water Investigations

We have adjusted our approach to water WINEP investigations to address the concerns raised by companies, the Environment Agency, Natural England and WRE. We have updated our assessment to take account of investigation complexity by investigations line, geographical scale (by WINEP scale grouping) and investigation driver type (by WINEP group). Allowances are determined for each investigation through triangulated unit-cost benchmarking across these three drivers. As we have significant concerns around the widespread non-delivery and overall underspend on WINEP investigations across the 2020–2025 period, we have capped allowances at requested levels if costs are deemed efficient. We have deep dived requests where companies receive a modelled challenge greater than 10% and uplifted allowances where companies provide compelling evidence for additional costs. This includes factors such as additional investigations included under WINEP Action Components and investigations included in the Environment Agency led Invasive Non-Native Species (INNS) programme.

Remaining WINEP/NEP enhancement areas

For the remaining WINEP/ NEP enhancement areas investments we do not change our method for assessing the companies' proposals.

In response to the Environment Agency, we agree that some types of WINEP interventions are more bespoke in nature. In the draft determination, we had already carefully considered the appropriateness of different cost assessment approaches, including benchmarking, for different WINEP enhancement areas. For schemes to improve fish passage and Drinking Water Protected Areas we do test companies requests against the median unit cost benchmark per action. This was to support identifying which companies to deep dive, or particular outliers, but we do not use it to set allowances and instead apply either a shallow or deep dive approach.

Our final determination

Companies requested in their representations £1.4 billion against these WINEP/NEP enhancement categories. Our final determination allowances for water WINEP/NEP are £1.3

billion. This is an increase from PR19 final determination which allowed companies £745 million for this area of enhancement.

We continue to use a combination of unit cost benchmarking, shallow dive or deep dive assessments to assess company proposals depending on the materiality of the totex requested. We have adjusted our approach to water WINEP investigations to address the concerns raised by companies, the Environment Agency, Natural England and WRE.

See 'PR24 final determinations: Expenditure allowances – Enhancement cost modelling appendix' for summaries of our assessment approaches and decisions for each area of water WINEP enhancement.

Table 20: Total allowances given for Water WINEP/ NEP (allowance for Water Investigations shown separately)

Company	Total allowance for Water WINEP/NEP programme (£ million)	Total allowance for Water Investigations programme (£ million)
Anglian Water	52.66	12.45
Dŵr Cymru	35.38	6.71
Hafren Dyfrdwy	2.57	0.89
Northumbrian Water	45.56	6.81
Severn Trent Water	368.56	43.96
South West Water	54.11	15.09
Southern Water	67.53	10.71
Thames Water	122.78	17.78
United Utilities	122.72	22.28
Wessex Water	38.21	16.32
Yorkshire Water	74.64	8.44
Affinity Water	157.30	10.70
Bristol Water	8.12	1.92
Portsmouth Water	4.20	4.16
South East Water	81.68	47.20
South Staffs Water	15.60	2.29
SES Water	4.29	1.70
Total	1255.88	229.39

3.3.7 Bioresources WINEP

For PR24 there are two statutory drivers under WINEP⁹⁰ and three under NEP⁹¹ which are in place to enable improvements in bioresources. These are:

- Actions under Sludge (Use in Agriculture) Regulations 1989 (SUiAR) and the Environmental Permitting (England and Wales) Regulations 2016 to improve resilience in the sludge supply chain to agriculture and other relevant use or disposal outlets. These statutory actions are in WINEP and NEP;
- Actions to meet requirements to prevent deterioration in soil quality or water quality. These statutory actions are also in WINEP and NEP; and
- Investigations into the production, treatment and use of sludge to determine and support good practice and any risks. These statutory actions are in NEP only.

What we said in our draft determinations

In the draft determination we followed a modelled process including shallow dives and deep dives to assess company requests of over £855 million enhancement investment under Bioresources WINEP.

In the draft determination, companies proposed a range of interventions including sludge storage (tanks and cake pads), thickening and dewatering activities, other sludge treatment (such as pelletisation) and sludge investigations (under NEP only). In our draft determination our approach to assessment was:

- Sludge storage tanks (WINEP and NEP): We assessed the investment for these combined lines using a unit cost benchmarking approach.
- Sludge storage cake pads (WINEP and NEP): We assessed the investment for this line using a median unit cost approach, with a percentage uplift applied to companies allowances to allow for differences in scope.
- Sludge thickening and dewatering (WINEP and NEP): We assessed the investment for this line by separating companies according to unit cost. Companies with efficient unit costs were assessed through a shallow dive approach. Companies with inefficient unit costs were assessed through deep dives.
- Other sludge treatment (WINEP and NEP): We assessed the investment for this line using a combination of deep dives and shallow dives depending on the materiality of the investments.
- Sludge investigations (NEP only): We assessed the investment for this line using a deep dive approach.

In our draft determination, we made allowances for all WINEP/NEP (SUiAR) actions, with the exception of requested costs for permit fees, administration costs and management systems

⁹⁰ SUiAR_IMP and SUiAR_ND

⁹¹ W_SUiAR_IMP1 W_SUiAR_NDIMP1 and W_SUiAR_INV1

to meet the requirements under Environmental Permitting Regulations. We excluded these actions on the basis that only two companies submitted costs and because the Environmental Permitting Regulations have not yet replaced the SUIAR. The requirements for compliance under EPR are due to be defined within the Environment Agency's Sludge Strategy, but its implementation date had yet to be confirmed.

Stakeholders' representations

Companies' representations on bioresources related WINEP/ NEP actions can broadly be categorised into the following areas.

Sludge storage tanks and Sludge investigations – We received no specific representations on our approach to assessing sludge storage tanks or Sludge investigations.

Sludge thickening – Companies did not make representation on our shallow dive / deep dive approach.

Sludge storage cake pads – Northumbrian Water, United Utilities and Wessex Water challenged our benchmarking approach. United Utilities stated that any economic assessment of the cost efficiency of the scope should be undertaken on a like-for-like basis and also that the cost per tonnes of dry solids might be used as an improved cost driver. Wessex Water and Northumbrian water suggested that a deep dive / outlier approach would be more appropriate given the differences in scope and complexity proposed by companies.

Sludge treatment (Other) – United Utilities disagreed with our decision to reject funding requested for sludge-to-land compliance costs under Environmental Permitting Regulations (EPR). United Utilities stated that the delivery of this WINEP action is a statutory obligation, and the Environment Agency has confirmed the need to deliver this action during the 2025–2030 period. Anglian Water in its representation removed its action related to sludge spreading equipment but included EPR costs for sludge-to land compliance.

In addition to the above representations, companies provided specific responses to points raised in our draft determination, regarding our modelled approach and deep dive assessments. We summarise these and respond to evidence provided in representations in our deep dive assessments. These can be found within the enhancement models⁹² for each individual WINEP/ NEP area.

Our assessment and reasons

Sludge storage cake pads – We agree that the modelled approach we applied at draft determinations did not sufficiently take account of variations in scope and acknowledge that we did not include differentiation between covered and uncovered storage solutions or

⁹² PR24 final determinations – Expenditure allowances – Enhancement cost modelling appendix, Ofwat, December 2024

additional scope such as odour control. To address this, we have altered our approach to account for both uncovered and covered cake pad storage and used an indicative benchmark of both types of storage to generate allowances for each company. We considered alternative cost drivers, such as Tonnes of Dry Solids (TDS) but by assessing the two main types of cake storage separately (covered and uncovered) and using surface area as the main cost driver, we obtained a good unit cost relationship across companies' proposals. Following our updated benchmarking approach, and updated scheme costs and scope from some companies, deep dives were not required.

Sludge treatment (Other) - On sludge-to-land compliance costs under Environmental Permitting Regulations, we accept that this is an approved WINEP action for United Utilities and we retain our deep dive approach as the cost assessment method for this funding request. Should the need to meet the EPR cost for sludge-to-land compliance requirement materialise during the 2025-2030 period, it is our understanding, based on discussions with the Environment Agency, that this action will be required for all companies carrying out sludge-to-land activities, and so we have assessed Anglian Water's submission on the same basis. Given that the introduction of EPR would impact on all companies, we have included enhanced cost sharing for all companies for all EPR related sludge-to-land costs.

Our final determination

Sludge storage tanks – For final determination we assess this cost line for these combined lines using a unit cost benchmarking approach.

Sludge storage cake pads – For final determination we assess this cost line using an indicative benchmark of both types of sludge storage cake pads (covered and uncovered). Costs deemed efficient compared to the indicative benchmark, or close to the benchmark are provided with the requested allowance. Costs deemed inefficient compared to the indicative benchmark are given their draft determination allowance.

Sludge thickening and dewatering – For final determination, we assess the investment for this line by separating companies according to unit cost. Companies with efficient unit costs are assessed through a shallow dive approach. Companies with inefficient unit costs were assessed through deep dive.

Sludge treatment (Other)– For final determination, due to the nature and variety of proposals under these lines, we continue to assess the investment for these lines through a deep dive approach.

We assess Anglian Water's costs on the same deep-dive basis as United Utilities, and given future uncertainty, we provide 25:25 cost sharing to all companies for related EPR costs, should these be required in the 2025-30 period.

Sludge investigations - With no specific representations on the approach to assessing this cost line, we retain our draft determination approach.

Companies requested in their representations £808 million against WINEP (SUiAR related actions) which has decreased from £855 million companies' October 2023 request. We have made allowances for all WINEP/NEP actions proposed.

See 'PR24 final determinations: Expenditure allowances – Enhancement cost modelling appendix' A1.1.24– A1.1.28 for summaries of our assessment approaches and decisions for each area of WINEP (SUiAR) enhancement.

Table 21: WINEP (SUiAR) allowances pre FS adjustments (£millions, 2022-23 prices)

Company	Sludge storage tanks	Sludge storage cake – Totex	Sludge treatment thickening – Totex	Sludge treatment other – Totex	Sludge investigations – Totex
Anglian Water	0.00	42.36	17.02	6.25	0.00
Dŵr Cymru	30.70	14.37	14.00	0.00	18.94
Northumbrian Water	0.00	36.94	18.10	0.00	0.00
Severn Trent Water	0.00	17.54	31.64	187.66	0.00
South West Water	0.00	4.60	28.06	0.00	0.00
Southern Water	0.00	51.07	0.00	0.00	0.00
Thames Water	0.00	0.00	0.00	0.00	0.00
United Utilities	0.00	60.00	33.19	16.49	0.00
Wessex Water	0.00	43.49	0.00	0.00	0.00
Yorkshire Water	0.00	37.78	5.76	0.00	0.00
Total	30.70	308.14	147.77	210.40	18.94

3.4 Bioresources (other enhancement)

3.4.1 Industrial Emissions Directive (IED)

The Industrial Emission Directive 2010/75 EU (IED) was the main EU instrument regulating pollutant emissions from industrial installations. The requirements of the IED were implemented in the UK through the Environmental Permitting (England and Wales) Regulations 2016 (EPR).

The IED sets out requirements to reduce harmful industrial emissions to achieve a high level of protection of human health and the environment. It regulates emissions to air, water, outputs management, and soil and groundwater contamination. Wastewater companies are required to obtain installation permits and expected to bring their applicable biological sludge treatment sites up to the standard required by the IED and the Best Available Techniques (BAT) reference document for Waste Treatment (the BREF).⁹³

What we said in our draft determinations

In the draft determination we applied cost benchmarking to the assessment of £1.6 billion enhancement investment to achieve compliance with the IED. We used a hybrid approach to model the efficient allowance for IED compliance comprising scheme level econometric modelling for secondary containment and tank covering costs, and company level unit cost benchmarking for all other IED costs.

We stated that the allowances for IED are for enhancement only, as base expenditure for IED compliance is covered by base allowances. We engaged with companies on the requirement to deliver earlier and stated that we expected companies to make every effort to have permits in place and to deliver the required improvement works by the December 2024 deadline (now extended to March 2025)⁹⁴.

Due to the significant range in costs submitted by companies, with a general trend for companies further progressed with achieving compliance, such as Northumbrian Water and Yorkshire Water, to propose lower unit costs, we considered that the high costs proposed by companies who have less developed proposals were unlikely to materialise and will be lower in practice. We proposed enhanced cost sharing rates⁹⁵ (25:25) to manage the risk that costs were higher or lower than our proposed allowances.

We set out that those companies that received funding at PR19 should continue the relevant interventions to achieve IED compliance in line with Environment Agency guidelines within the required timescales with their existing allowances and cost sharing rates. Those companies that did not receive funding at PR19 and are incurring cost prior to 2025 should allocate these costs as if this investment had occurred in PR24. The enhanced PR24 cost sharing rates (25:25) would apply to these IED costs.

Stakeholders' representations

Model – Dŵr Cymru and Yorkshire Water did not provide any comments on our IED approach to set allowances at draft determinations. Severn Trent Water agreed with our benchmarking models. Anglian Water stated that model performance is poor, and we should consider additional modelling for final determinations where possible. The remaining companies

⁹³ [Best Available Techniques \(BAT\) Reference Document for Waste Treatment Industrial Emissions Directive 2010/75/EU](#)

⁹⁴ Ofwat, '[IED Letter from Ofwat to Companies](#)', August 2022.

⁹⁵ Dealing with uncertainty, PR24 draft determinations: Expenditure allowances, Ofwat, June 2024.

raised concerns with the robustness of the models and proposed a deep dive approach to set IED allowances.

United Utilities proposed revising the secondary containment model to use the product of wall length and wall height (i.e. wall surface area) as a cost driver. For tank covering models, the company proposed collection of data on tank types to account for different kinds of assets covered. United Utilities also proposed that the methane reduction costs (Carbon Net Zero enhancement proposals) identified as IED costs should be reallocated to the IED tank covering cost models.

PCD timing

Most companies made representations around the 2025 compliance deadline in the PCD and expressed their concerns about meeting it.

Companies including United Utilities, Southern Water and Severn Trent stated that it is not appropriate to set the PCD output date as 2024/25, before the company has received any funding from customers, that this is not achievable because the scope of work required is only just becoming clear and that it will not be possible to agree alternative delivery dates with the Environment Agency as they have explicitly stated that they are not able to agree delivery dates beyond 31st March 2025.

Wessex Water stated that it will be engaging with the Environment Agency to agree an alternative IED delivery programme based on the best endeavours approach, but it is unlikely to have revised compliance dates agreed with the Environment Agency within the final determination timeframe. Wessex Water added that, while it acknowledges that Ofwat's proposed PCD delivery date of 31 March 2025 is to align with Environment Agency guidelines and timescales, it does not agree that this delivery date is reasonable because full compliance is not feasible by this date.

The Environment Agency stated that water and sewerage companies have been aware for over five years of the need to comply with the requirements of the Industrial Emissions Directive (IED). The deadline for compliance has now been extended to 31 March 2025, meaning that any IED enhancement work carried out in the 2025-30 period will come too late to avoid water companies being in breach of their legal obligations. The Environment Agency added that it supported Ofwat's decision to provide funding for expenditure incurred for IED enhancement work completed before the March 2025 compliance deadline on the basis that it encourages and rewards good performance.

Our assessment and reasons

Model – In response to company representations, we have tested various modelling approaches and additional cost drivers. We retain our benchmarking approach in preference to deep dives but to improve the overall robustness and performance we revise the cost

drivers⁹⁶ for our secondary containment models, utilising wall surface area and volume of bund as cost drivers. We retain our draft determination position of applying an upper-quartile catch-up efficiency challenge for secondary containment costs.

We retain our approach to tank covering models as they performed better with the updated final dataset and maintain the view to use the median company efficiency challenge for tank covering as it provides a sufficient cost efficiency challenge.

Following stakeholder feedback, we have decided to revisit our approach to other IED costs, and apply the company level modelled efficiency of secondary containment and tank covering to other IED costs. This approach effectively assumes that company specific inefficiency is common to secondary containment, tank covering and other IED costs. For Severn Trent Water and United Utilities, we cap the allowance at requested costs as modelled secondary containment and tank covering costs are higher than requested costs.

Updates to cost data in companies' representations (particularly companies identified as efficient in our draft determination) have resulted in a substantial lessening of the efficiency challenge and an increase in allowances compared to our draft determinations. We have further validated our final determination site-level allowances against the costs per site submitted by the companies⁹⁷ who received specific settlement as part of the CMA process. These companies initiated discussions with the Environment Agency and started addressing IED requirements at an earlier stage than other companies; they therefore have greater certainty on their IED costs submissions.

PCD timing

We retain our view on IED delivery dates. We expect companies to make every effort to have permits in place and to deliver the required improvement works by the December 2024 deadline (now extended to March 2025). As set out in our draft determination, those companies that did not receive funding⁹⁸ at PR19 and are incurring cost prior to 2025, should allocate these costs as if this investment was incurred in PR24. The Price Review process should not be a reason for delaying compliance⁹⁹.

We expect companies to deliver the required improvement works by the (extended) March 2025 deadline, unless otherwise agreed with the Environment Agency or Natural Resources Wales.

⁹⁶ PR24 Final Determination Expenditure Allowances, Enhancement cost modelling Appendix, Ofwat, December 2024.

⁹⁷ Northumbrian Water and Yorkshire Water

⁹⁸ This applies to Anglian Water, Severn Trent, South West Water, Southern Water, Thames Water, United Utilities, Wessex Water, Welsh Water and partially to Yorkshire Water.

⁹⁹ PR24 final determinations- Price Control Deliverables appendix, Ofwat, December 2024

Our final determination

Overall, companies requested £1.6 billion¹⁰⁰ against IED enhancement in their representations.

For final determination, we retain our benchmarking approach. We use an updated suite of three models to set secondary containment allowances, using secondary containment surface wall area and volume of bund as cost drivers.

We apply a hybrid approach to model the efficient allowance for IED compliance, comprising:

- scheme level econometric modelling for secondary containment and tank covering costs; and
- applying the company level modelled efficiency of secondary containment and tank covering to other IED costs.

We set the efficient bioresources IED enhancement allowances at final determinations as follows:

- for secondary containment costs, we apply an upper-quartile catch-up efficiency challenge;
- for tank covering costs, we apply a median catch-up efficiency challenge; and
- for other IED costs, we apply the company level modelled efficiency of secondary containment and tank covering to other IED costs.

We set bioresources IED allowances that will incentivise companies to deliver IED upgrades efficiently. We also retain 25:25 cost sharing for IED interventions to recognise the higher cost uncertainty compared to other costs.

We continue to expect companies to make every effort to have permits in place and to deliver the required improvement works by the (extended) March 2025 deadline, unless otherwise agreed with the Environment Agency or Natural Resources Wales.

Table 22: Total IED totex allowances after adjustments (£ million, 2022-23 prices)

Company	Allowance
Anglian Water	104.45
Dŵr Cymru	14.30

¹⁰⁰Northumbrian Water following confirmation by the company that its cost and cost drivers remain the same. The company did not submit table ADD14 in its representation.

Hafren Dyfrdwy	0.00
Northumbrian Water	0.00
Severn Trent Water	274.33
South West Water	38.99
Southern Water	137.65
Thames Water	299.67
United Utilities	238.26
Wessex Water	76.16
Yorkshire Water	81.44
Total	1,265.24

3.4.2 Other bioresources enhancement

What we said in our draft determinations

In their business plans, some companies proposed enhancement actions associated with bioresources activities in addition to those approved under WINEP or required to achieve compliance with the IED. These included a variety of interventions mainly related to mitigating concerns over the perceived risk of loss of landbank availability, the application of Farming Rules for Water (FRfW)¹⁰¹ and related activities.

Companies expressed concerns around the available funding mechanisms to address the requirements and deal with the risks associated with the bioresources control. United Utilities stated that "it is sufficiently unclear as to whether any future change in the Bioresources regulatory framework would qualify as a Relevant Change in Circumstance, given that (a) the precise route to the loss of landbank is currently unclear, and (b) whether or not the loss would arise directly as a change in legislation to water companies, or indirectly via restrictions placed onto the agricultural sector." United Utilities added: "We believe that the agricultural outlet risk should be recognised as a Notified Item, as defined under condition B of our instrument of appointment."

In our draft determination, following a series of deep dive assessments, we did not make allowances for resilience actions that were not approved through WINEP, such as sludge screening applications, changes to some companies' bioresources strategy, feasibility work for alternative outlets for sewage sludge, and actions for the transition to the Advanced Thermal Conversion (ATC) of sewage sludge. We stated that there was insufficient evidence to justify supporting actions that go beyond those agreed by the Environment Agency and that from our discussions with the Environment Agency, its preference remains for farmland

¹⁰¹ The Reduction and Prevention of Agricultural Diffuse Pollution (England) Regulations 2018

applications and it was in principle not supportive of options such as thermal destruction technologies.¹⁰²

We rejected enhancement funding for Advanced Anaerobic Digestion interventions on the basis that some companies have previously funded a move to advanced anaerobic digestion through base expenditure and growth allowances, as the interventions can lead to significant reductions in operational costs, due to reduced transport costs and the generation of gas/electricity as a byproduct that can be sold.

We recognised that uncertainty remains around landbank availability, both within the 2025–2030 period and beyond, and proposed a 50:50 (dependent on the QAA outcome) base cost sharing mechanism for the bioresources control and enhancement expenditure subject to 40:40 rates (in addition to 25:25 sharing for IED) to support companies in managing this uncertainty. We proposed a Notified Item to cover any increase in costs to bioresources reasonably attributable to any new or changed legal requirements in relation to the application to agricultural land of fertiliser derived from sludge over the 2025–26 to 2029–30 period.

We considered a Notified Item was appropriate because spreading treated sewage sludge is the main outlet for bioresources operations and the impact of changes could be material, and new or changed legal requirements would not necessarily otherwise qualify for an interim determination because they might not apply directly to companies. We acknowledged that bioresources activities might be affected by the Environmental Permitting Regulations (EPR) replacing the Sludge (Use in Agriculture) Regulations (SUiAR), and that these requirements are due to be defined within the Environment Agency's Sludge Strategy and its implementation date is yet to be confirmed.

We stated that the Notified Item does not cover costs in relation to compliance with the existing legal requirements in the Farming Rules for Water (FRfW) and that it was our understanding that the resilience of the biosolids supply chain to agriculture was included in the PR24 WINEP for the 2025–30 period (intending to address FRfW compliance).

Stakeholders' representations

Additional funding request beyond WINEP or IED

Companies did not make representation on our deep dive approach, but made representation on key policy areas.

Advanced Digestion / AAD

¹⁰² Information letter to Water and Sewerage Companies: Water Industry National Environment Programme – Sludge (Use in Agriculture), Environment Agency, May 2023.

Anglian Water challenged our decision to reject its request for enhancement funding for its Bioresources resilience intervention at Colchester sludge treatment centre and stated that the allowance to deliver the full increase in capacity is required through enhancement allowances, split between growth and resilience. Anglian Water stated that this cannot be delivered through growth only.

In addition, Southern Water, in response to our rejection of funding for its cost adjustment claim proposal for AAD plant, re-submitted a base cost adjustment claim requesting funding to increase AAD capacity in two sludge treatment centres. Southern Water outlined in its claim that other companies had received additional allowances for step-change transitions towards AAD prior to 2012 which may not be captured in our base cost models.

Alternative outlets / adaptive planning

United Utilities disagreed with our decision to reject funding requested for alternative outlet adaptive planning and provided new evidence to address the challenges in our draft determination. United Utilities added that it is clear to the company that the WINEP process does not adequately reflect the wider environmental needs that the company and the industry must plan for, including the potential long-term consequences of Farming Rules for Water on the agricultural sector and how that will lead to a deficit in available landbank for the sector. Yorkshire Water included a new funding request for a trial of destruction to land technology (ATC).

South West Water accepted our draft determination and removed the costs related to its ATC trial and landbank mitigation intervention.

Wessex Water retained its funding request for Environmental Permitting Regulations for its liming sites and clarified how this is different from its IED request.

Notified Item for Bioresources

In their representation to our draft determination several companies requested a widening of the scope of the Notified Item stating that it should not be restricted to legal changes only and should include actions beyond Environment Agency's approved WINEP interventions.

Several companies including Anglian Water, Severn Trent and United Utilities considered that the interim determination materiality and triviality thresholds should be amended to align to the revenue associated with the separate Bioresources price control, setting out that materiality and triviality conditions should be assessed at the level of the relevant price control rather than Appointee turnover, that being the Bioresources Price Control.

United Utilities stated that there are significant shortcomings in the proposed scope of the Notified Item to manage landbank risk. United Utilities set out that there are alternative triggers that extend beyond legal changes and the WINEP process does not adequately reflect

the wider environmental needs that the industry must plan for. United Utilities added that this includes the potential long-term consequences of Farming Rules for Water on the agricultural sector, and how that will lead to a deficit in available landbank for the sector. Yorkshire Water added that the Notified Item needs to apply to all exogenous factors that may lead to landbank loss. Anglian Water suggested that the Notified Item should cover the additional cost for the disposal of sludge arising from a change in the availability of land bank (due to a reduction in available land bank, an increase in the required land bank, or both). Wessex Water added that the proposed Notified Item has issues that will limit its efficacy. Wessex Water proposed a targeted reopener of the bioresources price control, where the trigger could be any event that can impact landbank availability, includes for Farming Rules for Water compliance with materiality set at bioresources price control level.

The Environment Agency stated that it recognises the effort by Ofwat to look at the challenges being faced by the companies and their biosolids supply chain to agriculture and would welcome continued engagement with Ofwat on this matter.

Our assessment and reasons

Additional funding request beyond WINEP or IED

We continue with our deep dive approach to assessing other bioresources funding request beyond WINEP or IED.

Advance digestion / AAD

We acknowledge that some companies have delivered AD/AAD through base expenditure, while others have delivered it through growth and quality enhancement expenditure. As a result, the base models could be considered to only partially reflect the implicit cost of transition to AD/AAD.

To address this, we have revised our bioresources base models for final determination. In our final determination, our bioresources base models include historical data on operating and capital expenditure for bioresources base, growth and quality enhancement which provides companies with an implicit allowance through base. As a result, the bioresources base model¹⁰³ now provides companies with an implicit allowance for AD/AAD.

Therefore, we reject all company requests for enhancement expenditure for AD/AAD, as funding is now implicit within the base allowances. This applies to Anglian Water's Bioresources resilience (Colchester STC) proposal, and consideration of Southern Water's base cost adjustment claim.

¹⁰³ PR24 Final Determinations – Expenditure Allowances – Base cost modelling decision Appendix, Ofwat, December 2024

Alternative outlets / adaptive planning

We maintain our position of not allowing funding for resilience actions that were not approved through WINEP, such as actions for the transition to the Advanced Thermal Conversion (ATC) of sewage sludge. We consider that there is still insufficient evidence to justify supporting actions that go beyond those agreed by the Environment Agency. This includes Yorkshire Water's ATC trial and landbank mitigation and United Utilities' alternative outlet adaptive planning actions.

General option feasibility and initial design work is funded from base allowances, and companies can carry out such work if they consider the risk to be sufficient.

Extensive discussions were held between companies and the Environment Agency in developing the WINEP programme. The Environment Agency considers that an objective of the sludge driver is to develop contingency measures when business as usual is disrupted to improve the resilience of the supply chain of biosolids to agricultural land, but recognises that in PR24 it did not set out to solve the water industry bioresources challenge in its entirety. It is our understanding that the Environment Agency continues to view treated sludge to land as the preferred option, and the case is not yet clear for a move away from sludge to land to alternative outlets and treatment technologies such as ATC.

We continue to recognise that uncertainty remains around landbank availability, both within the 2025-2030 period and beyond. Four alternative sludge treatment projects have been funded through the Innovation Fund, and we welcome further Innovation Fund submissions in this area going forward.

We will continue to work with companies, the Environment Agency and Defra to understand the long-term bioresources strategy in advance of PR29.

We retain our draft determination proposal for cost sharing for bioresources and we have reviewed the scope of the Notified Item for bioresources based on companies' representation to provide additional protection if new statutory guidance or governmental directions to the Environment Agency and Natural Resources Wales drive a transition away from sludge to land within the 2025-2030 period.

Notified Item for Bioresources

We acknowledge companies' concerns and the uncertainty that may affect bioresources activities and sludge management chain as a result of loss of landbank. Since our draft determination we have carried out significant engagement with the companies, the Environment Agency and Defra to understand the risk to the supply chain.

Following continued liaisons with the Environment Agency and companies, we acknowledge that WINEP actions in PR24 were not designed to solve the water industry bioresources

challenge in its entirety so, we recognise that although WINEP covers resilience to the current supply chain, it may not fully cover the impacts of any changes that occur as a result of change or removal of the statutory guidance to the Environment Agency on applying the Farming Rules for Water (FRfW).

After considering responses to our draft determination consultation, the final Notified Item wording therefore also includes the impact of any new or changed statutory guidance¹⁰⁴ or direction from Defra or the Welsh Government to the Environment Agency or Natural Resources Wales in relation to the exercise of their functions in this area. We recognise that Ministerial guidance or directions could impact on the operation of the legal regime and that there is currently some uncertainty because Defra is currently undertaking a review of its existing statutory guidance to the Environment Agency regarding the application of the Farming Rules for Water.

We do not agree with company proposals to expand the Notified Item to include any event that could impact landbank availability, such as end-user perception. It is for companies to manage risk that is within management control, and it is difficult to separate the actions of water companies from the views/perceived views of their customers or supply chain. We consider that there are risks in relation to sludge to land application, which companies can take a proactive approach and carry out constructive stakeholder management with their end-users and suppliers and understand areas of concern and how to best meet farmers' needs and requirements.

We also do not agree with company requests to reduce the interim determination materiality and triviality thresholds that would apply in relation to this Notified Item. We proposed this Notified Item at draft determination so that companies would have the same level of protection whether any changes in legal requirements in relation to landbank use for bioresources apply directly or indirectly to companies. Companies will therefore have the same level of protection that applies in relation to new or changed legal requirements in relation to their wider water and sewage related activities. We do not consider it appropriate for the interim determination materiality and triviality thresholds to be different for different potential changes in legal requirements that could affect companies during the price control period.

Our final determination

Additional funding request beyond WINEP or IED

We retain our draft determination approach of assessing additional bioresources funding requests through deep dives.

¹⁰⁴ The existing guidance is: Applying the farming rules for water, Statutory Guidance, DEFRA, June 2022

Advance digestion / AAD

We make amendments to the base allowances to reflect historical expenditure on AD/AAD. This ensures that there is implicit funding within base allowances to enable the transition to AD/AAD. Consequently, we reject all requests for enhancement funding for AD/AAD as a result of base overlap.

Alternative outlets / adaptive planning

We have not made allowances for resilience actions that were not approved through WINEP. Extensive discussions were held between companies and the Environment Agency in developing the WINEP programme. There is insufficient evidence at this stage to justify supporting actions that go beyond those agreed with the Environment Agency.

See 'PR24 final determinations: Expenditure allowances – Enhancement cost modelling appendix' for summaries of our assessment approaches and decisions for each area of Wastewater freeform model.

Notified Item for Bioresources

We have updated the scope the Notified Item¹⁰⁵ for bioresources in all wastewater companies' final determinations in relation to potential increases in bioresources costs over the 2025–26 to 2029–30 period. This Notified Item applies to increases in costs because of changes in relation to the application to agricultural land of fertiliser derived from sludge from:

- Any new, changed legal requirements; or
- Any new or changed statutory guidance or direction from Defra or the Welsh Government to the Environment Agency or Natural Resources Wales.

This would allow price controls to be changed in-period through an interim determination if the impact on costs, alone or in combination with other eligible items, met the materiality threshold in licence condition B. In the event of an interim determination, no account will be taken of any costs to the extent that they would have been, or would be, avoided by prudent management action.

We acknowledge that bioresources activities might also be affected by the Environmental Permitting Regulations (EPR) replacing the Sludge (Use in Agriculture) Regulations (SUiAR). These requirements are due to be defined within the Environment Agency's Sludge Strategy and its implementation date is yet to be confirmed.

We acknowledge companies concerns and the potential uncertainty for Bioresources activities. We consider that the bioresources allowances provided under WINEP and IED,

¹⁰⁵ PR24 Final determinations – Expenditure allowances, 4.7 Dealing with uncertainty, Ofwat, December 2024

along with our revised bioresources base ¹⁰⁶models, cost sharing ¹⁰⁷ for bioresources, and our amended Notified Item, provide sufficient coverage and risk management given the current information available and sector circumstances.

3.5 Meeting Habitats, Water Framework Directive and Protected Landscapes obligations

Some responses to our draft determinations raised our obligations as a public authority, including our duties to have regard to the requirements of the Habitats Directive so far as they may be affected by the exercise of our functions and in exercising functions so far as affecting a river basin district, to have regard to the river basin management plan for that district.¹⁰⁸ Some responses also raised concerns that our draft determinations did not include sufficient detail for interested parties to identify how the requirements of legislation like the WFDR will be met in relation to individual waterbodies or sites. Some respondents were also keen to know that we are taking into account the statutory duties of public authorities and water companies concerning Protected Landscapes which have been changed recently. In relation to England they require public authorities and water companies in exercising or performing any functions in relation to, or so as to affect, land in Protected Landscapes to seek to further (rather than have regard to) the purpose of conserving and enhancing the natural beauty of the Protected Landscape and, in some cases, other purposes.¹⁰⁹

The WINEP in England and NEP in Wales are key mechanisms for improving the impact of the water sector on the natural environment. The WINEP/NEP set out the company actions required by the Environment Agency and Natural Resources Wales to meet certain environmental legislative requirements in England and Wales.¹¹⁰ These include the protection of habitats under the Habitats Regulations, and contributions towards river basin management plan objectives. Where appropriate, information on individual schemes was published as part of our benchmarking models, and as part of our price control deliverables. We also expect environmental assessments to be carried out where appropriate.

In carrying out the price review, we are cognisant of our statutory obligations relating to habitats and species, river basin management plans and Protected Landscapes in England

¹⁰⁶ PR24 Final determination – Expenditure Allowances – Base cost modelling decision appendix, Ofwat December 2024

¹⁰⁷ Base expenditure is subject to cost sharing of up to 50:50 (dependent on the QAA outcome) and enhancement expenditure subject to 40:40 rates (except for IED enhancement expenditure and EPR where rates are set at 25:25).

¹⁰⁸ See [regulation 9\(3\)](#) of the Conservation of Habitats and Species Regulations 2017 and [regulation 33](#) of the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.

¹⁰⁹ The changes were made by [section 245](#) of the Levelling-up and Regeneration Act 2023.

¹¹⁰ See, for example, the [Water industry national environment programme \(WINEP\) methodology](#) that explains that the "primary role of the WINEP is to provide information to water companies on the actions they need to take to meet the environmental legislative requirements that apply to water companies in England".

and Wales. We ensure that the price controls we determine make appropriate provision for the efficient costs of WINEP/NEP. Our investment validation process is why more detailed information in relation to individual waterbodies and sites did not need to be published as part of our draft determination consultation. We validate the need for each investment area against companies' obligations set out in the WINEP/NEP. We do not challenge the need for company proposals under WINEP/NEP enhancement expenditure where requirements are needed to comply with statutory obligations; are validated against the WINEP/NEP; and companies have provided sufficient and convincing evidence that there are no funding overlaps with base or previously funded WINEP/NEP activities. The Environment Agency and Natural Resources Wales will monitor the delivery of the WINEP/NEP. We will also monitor delivery of WINEP/NEP enhancement expenditure as part of monitoring delivery of a company's overall enhancement programme. Where it is appropriate for us to do so, we will take action for non-delivery.

With regard to relevant requirements that apply to water companies, including duties concerning Protected Landscapes, we expect that companies' schemes either reflect the impact of the requirements in their proposed design or will need to as a matter of course, in line with their statutory obligations, when they develop those schemes. Our final determinations provide funding, on a best value basis, for all schemes which relate to or may affect Protected Landscapes.

3.6 Water resources management plans (WRMP)

Water resources management plans (WRMPs) are a statutory strategic planning framework developed and published by water companies every five years¹¹¹. Water companies have a statutory duty under Section 37 of the Water Industry Act (1991)¹¹² to prepare, publish and maintain a WRMP, and develop and maintain an efficient and economical system of water supply within its area. The plans set out how water companies intend to maintain water supply resilience for customers and the environment over at least the next 25 years. The WRMPs forecast the company supply demand balance in a drought over the planning horizon, and how these will be impacted by drivers, such as abstraction reductions, population and business growth, and climate change. Companies are required to present a range of feasible supply and demand options to meet any identified deficits and demonstrate decision making processes to select the best value options for their preferred plans.

Since the draft determinations, some WRMPs have either progressed to final publication or have been given permission to publish by the Secretary of State for Defra. For these plans, the needs case for investment has been accepted by the Secretary of State. However, some plans remain at revised draft stage or are being reconsulted on. For our assessment, we have used the latest plans available. The inherent flexibility in our allowances funds a unit rate for

¹¹¹ Environment Agency, Ofwat, Natural Resources Wales, [Water resources planning guideline](#), April 2023

¹¹² UK Government, [Water Industry Act, 1991, Section 37](#)

supply benefit rather specific schemes. This allows for changes in schemes or approaches to delivering the WRMP if required. This is reflected in our price control deliverables (PCDs).

The enhancement allowances set out in these sections and the implicit base allowances to maintain and enhance the supply demand balance are sufficient and adequate to enable the 2024 WRMPs (WRMP24) to be delivered in full over the 2025–2030 period, including the development of schemes needed to deliver timely benefits after 2030. As stated in Appendix 9 of our PR24 final methodology (pg. 87)¹¹³, companies are expected to utilise these expenditure allowances to meet their statutory duties in delivering on its WRMP to maintain an efficient and economical supply of water. This includes the expenditure allowances set out in the following sections:

- Supply
- Supply interconnectors
- Strategic resource options
- Leakage
- Metering
- Water efficiency

3.6.1 Supply

The supply component of the WRMP includes schemes which provide a water available for use (WAFU) benefit to the company and/or water resource zone (WRZ) supply demand balance through providing additional supply. This can include the development of new or existing sources of supply, such as groundwater sources and water recycling schemes, or improvements to the company's distribution network to provide supply to where it is needed.

What we said in our draft determinations

Our PR24 draft determinations were based on the latest available information in company revised draft WRMPs in addition to business plans. We used unit cost benchmarking to determine efficient expenditure allowances for water supply schemes. We split water supply schemes into five complexity/ asset intensity categories based on engineering assessment of scheme types and scope. Prior to including schemes in our unit cost model, we assessed schemes against our enhancement criteria (i.e. need for enhancement and best option for customers). This included implementing best value cost challenges where we had residual concerns over the level of optioneering that had been undertaken in WRMP processes, which had led to inclusion of high unit cost options. We also challenged where activities were considered to overlap with base expenditure or had previously been funded at PR19. Within each scheme complexity category, we set the efficient cost based on the median unit cost per Ml/d of scheme benefit. To better represent efficient unit costs over a diverse range of

¹¹³ Ofwat, Our final methodology for PR24: Appendix 9 – setting expenditure allowances, page 87

options, we split water supply schemes into five complexity / asset intensity categories: very low; low; medium; high; and fifth category of schemes which included base maintenance activities.

We undertook an industry-wide assessment of supply options presented in business plans for investment in 2025–2030 that did not appear on preferred pathways (i.e. only adaptive pathways) in companies WRMP data tables. We assessed submissions to identify whether there was sufficient and convincing evidence against the principles set out for adaptive pathways in the PR24 methodology.

We allowed Thames Water an additional resilience uplift of £67 million to deliver an additional 18.06Ml/d of supply benefit over the 2025–2030 period to address the resilience shortcomings in the company's revised draft WRMP24. With this allowance, we expected Thames Water to consider delivering a higher level of service for temporary use ban (TUBs) than it was currently planning for and an improved (faster) glidepath to 1-in 200 year emergency drought order resilience.

In the draft determination we allowed companies over £1.5 billion to deliver supply schemes providing 189 Ml/d benefit (excluding interconnectors and strategic resource options) to address water supply and demand balance issues in the 2025–2030 period, and begin development of supply schemes to deliver benefit beyond 2030.

Stakeholders' representations

We have categorised company representations on supply schemes into the following areas: base activity overlap, supply scheme complexity categories, new schemes, scheme costs and benefits, other representations.

Base activity overlap

In the draft determination we applied a 20% cost efficiency challenge where we identified a base activity overlap concern, rising to 30% for significant concerns across multiple areas. These adjustments were primarily applied to water treatment upgrade schemes.

Anglian Water, South West Water and Northumbrian Water acknowledge a proportion of investment could overlap with base allowances and provide additional evidence on the proportion of overlap with base expenditure. Northumbrian Water state that the base activity complexity category was too broad, containing both schemes that expanded existing assets and processes and those which were entirely new assets and processes.

Supply scheme complexity categorisation

Anglian Water, Southern Water, Wessex Water and Yorkshire Water disagreed with the unit cost complexity category we had assigned to some schemes and provided evidence to support reassigning schemes to other complexity categories.

Further detail on schemes and evidence include in the representations for scheme complexity categories are included in the 'scope adjustment' deep dive in our supply model.

New schemes

Some companies presented additional schemes in their representations. This included both supply schemes and adaptive planning schemes.

Northumbrian Water, Anglian Water and South Staffs Water presented new adaptive planning requests for assessment in the final determination. Southern Water presented new schemes that it is reconsulting on in its revised draft WRMP.

Wessex Water adjusted its costs for its adaptive pathway schemes in response to our draft determinations on our challenge to its proposed adaptive pathway investment.

Scheme costs and benefits

Some companies presented increased scheme costs in representations. Severn Trent Water and Yorkshire Water cite early start investigations which identify scope change and therefore cost increases since original business plan submission in October 2023.

Anglian Water, Wessex Water and South West Water raised concerns with the benefit (Ml/d) value that we were using in the unit cost model.

Dŵr Cymru removed its enhancement request for supply schemes in its representation.

Further detail on schemes and evidence include in the representations for scheme complexity categories are included in the 'scope adjustment' deep dive in our supply model.

Other points raised in representations

Companies provided some specific feedback in representations on points raised in our draft determination deep dives assessments. We summarise these and respond to evidence provided in representations in our deep dive assessments for final determination. These can be found within the supply enhancement model.

We also received representations from non water company stakeholders.

- The Environment Agency highlights concerns that we have challenged scheme costs (for example on efficiency) in the draft determination, and where we had not supported

customer funding for schemes on alternative pathways which we did not think were justified.

- Natural England similarly raises concerns that some supply schemes had reduced allowances at the draft determination and seeks assurance that all options in WRMPs are funded from development through to completion.
- North East Lincolnshire Council and Water Resources East (WRE) highlight growth in key non household sectors, including those linked to the UK's transition to net zero on the South Humber Bank. They highlight that further funding is needed to progress supply options at pace.
- Sussex North authorities respond on the water neutrality challenges in its area and are pleased that Southern Water's Ford water recycling scheme has been allocated customer funding.
- Veolia Tidworth (a New Appointment and Variation (NAV) operating in the Wessex Water area) highlights that if the final determinations were to impact Wessex Water's ability to carry out planned WRMP actions it could have a knock on impact on water availability and the ability to continue supplying the NAV.

Our assessment and reasons

We have considered the draft determination representations and have made adjustments to our approach, where appropriate. We set out our assessment and reasons below.

Unit cost benchmarking (cost efficiency)

At draft determination we applied a unit cost approach to determine allowances for supply enhancement. These were split into five complexity/ asset intensity categories based on engineering rationale of scheme types and scope.

Wessex Water stated that the complexity categories underestimate the complexities of the options which have multiple assets, and therefore does not appropriately allow benchmarking across companies.

We retain our group complexity categorisation approach. This allows similar schemes to be compared and benchmarked across companies, and better represents the more diverse range and scale of options presented at PR24 in comparison to previous price reviews. We have deep dived scheme costs where complex schemes have multiple asset-type components to understand the main driver of scheme type and cost. We continue to benchmark scheme costs with a complexity category as we consider that schemes are sufficiently similar to allow costs to be compared and understand efficiency in delivering supply benefit across the industry.

We have moved some schemes between complexity categories in response to further information on scheme scope provided in representations. This includes where schemes were shown to utilise mostly existing infrastructure which reduces the level of complexity and

cost of the scheme. We have updated table definitions and scheme examples to better reflect this. We accept Anglian Water's proposal that its Marham scheme should be considered as a treatment scheme due to its scope. We accept Yorkshire Water's proposal to categorise two groundwater-focussed schemes as 'medium' instead of 'low', which would result in a higher allowance for the schemes. We consider that its network enhancement scheme should remain in the 'low' category to be consistent with the approach to schemes predominantly utilising existing assets. We accept Wessex Water's proposal that its 'Increase reservoir capacity' scheme should be re-categorised from 'high' as the scheme scope is not driven by the reservoir asset itself but by network and treatment expansion: we have re-categorised as 'medium'. Based on further scheme details we categorise the three Southern Water groundwater schemes and one transfer scheme as better aligned with the 'low' categorisation, as opposed to 'medium' due to the predominant use of existing sources or assets.

In response to the Environment Agency, Natural England and Veolia Tidworth, the unit cost approach discussed in this section, and the enhancement allowances determined by it and set out in these sections are sufficient and adequate to enable the 2024 WRMPs be delivered in full over the 2025–2030 period. This includes the implicit base allowances to maintain and enhance the supply demand balance and the development of schemes needed to deliver timely benefits after 2030.

Adaptive pathways (need for enhancement investment)

Adaptive pathways represent alternative futures to the preferred WRMP programmes, driven by uncertainties in population growth and climate change. The pathways set out the options required to ensure resilience in these futures, and when these are triggered. In representations, some companies present additional adaptive pathways schemes for funding over the 2025–30 period.

For the final determination we do not change our method for assessing adaptive pathway options. In response to the Environment Agency and Natural England, we continue to allow funding for options on adaptive pathways that represent alternative futures to the preferred WRMP programmes. This is important to ensure companies can adapt in a timely manner to secure resilient supplies in uncertain futures. We continue to assess submissions to ensure there is compelling evidence for the need for investment against the uncertainties presented in the adaptive pathways, so as to avoid significantly uncertain investment that risks higher customer bills than necessary. The need for investment is assessed against the principles set out for adaptive pathways in the PR24 methodology¹¹⁴:

- that there is a related adaptive pathway;
- that the option lead in time covers multiple price controls and means development must commence now;

¹¹⁴ Ofwat, PR24 Final Methodology, Appendix 9: Setting expenditure allowances, pg. 112–113

- that preparatory investment in this price control is material and better value rather than delaying for when certainty is known;
- that the scheme is the best, efficient option to meet the need; and
- there is appropriate customer protection in place to ensure work is progressed.

We continue to apply adjustments to allowances where the evidence presented is not sufficient and convincing against the criteria set out. For example, where:

- development activities overlap with those considered as base option development¹¹⁵;
- where the option lead in time would mean that the option could be funded in a later period when there is greater certainty of need; and
- where funding is required later in the period and so could be better value to be covered by future funding mechanisms rather than being funded now when there is uncertainty over the need.

We require companies to provide updates on adaptive pathway scheme development progress and investment spend and through reporting for WRMP24 Annual Reviews and APR. This should include updates on monitoring in place for the need to switch to adaptive pathways by trigger dates (and thus the likelihood of needing the adaptive pathway options in development), and any risks and barriers to the options identified through development.

Our assessments are set out on the 'Adaptive planning' deep dive worksheet in the supply model.

Non-delivery and avoiding customers paying twice (need for enhancement investment)

We adjust proposed PR24 water supply enhancement investment where this overlaps with non-delivered PR19 funded water supply enhancement. In our draft determination we applied a non-delivery adjustment to Affinity Water, Southern Water and Thames Water allowances.

Affinity Water accepts the draft determination assessment and no longer proposes enhancement investment for its 'Tappington South' scheme. We make no further adjustment for final determinations.

Southern Water and Thames Water do not represent on this aspect of our draft determination assessment. For the final determination we maintain that the companies have not provided sufficient and convincing evidence that the non-delivery of PR19 funded supply enhancement, has influenced, or overlaps with, proposed PR24 supply enhancement investment. We continue to adjust both companies supply enhancement allowances for PR19

¹¹⁵ Companies are required to develop WRMPs and the options within them to the level of detail set out in the [Water resources planning guideline](#). This activity is therefore part of base allowances, and any option development on adaptive pathway to this level would also be considered base expenditure.

non-delivery. The non-delivery efficiency challenge has also been updated for the final determination in response to unit cost changes in the supply model.

For Southern Water we have increased the non-delivery adjustment to be based on 12.6ML/d (an increase from 11.0 ML/d at draft determinations). This is due to an addition of 1.6 ML/d benefit associated with the 'Groundwater (SNZ): Rogate refurbishment' scheme which has been determined as a non-delivery following additional evidence assessed for final determinations. In the case of Southern Water, the non-delivery adjustments made in the supply model are separate and non-inclusive of further adjustments made through the in-period outcome delivery incentives (ODI) model. The ODI model considers non-delivery adjustments for ten specific schemes named under the incentive set at PR19. The supply model non-delivery adjustment considers only schemes outside of the PR19 ODI. Further information on Southern ODI adjustments can be found in 'PR24PD01FD Outcome delivery incentives model 2024-25 - Southern Water'.

Base overlap (need for enhancement investment)

In our draft determination we identified where companies had not provided sufficient and convincing evidence that proposed supply enhancement expenditure did not overlap with activities expected to be delivered through base costs. This are largely covered activities and schemes related to water treatment. We applied a 20% cost efficiency challenge where we identified a base activity overlap concern, rising to 30% for significant concerns across multiple areas.

Anglian Water and South West Water acknowledge a proportion of investment could overlap with base allowances. The companies disagreed with the 30% cost efficiency challenge and proposed a 13% and 14% base activity overlap adjustment respectively.

Northumbrian Water state that the base activity complexity category was too broad, containing both schemes that expand existing assets and processes and those which are entirely new assets and processes. The company view this as the key driver in schemes appearing efficient and inefficient in this category. The company accepts the 20% challenge applied to schemes that upgrading existing assets, but states that this should not apply for schemes where the entire treatment asset or process is new.

For the final determination we change our approach. For supply schemes that fall within this category, we have queried companies for additional information to differentiate between schemes that upgrade or expand current assets and processes at treatment works and those that are for new treatment works and process. We apply a reduced 15% efficiency challenge to schemes that upgrade existing works and processes, following information provided by Anglian Water and South West Water. We do not apply an efficiency challenge to schemes where we assess the treatment works or process as new.

We have also applied a 15% efficiency challenge to other schemes, outside of this category, where we have concerns that the activities predominately involved existing treatment assets.

Our assessments are set out on the 'Non-enhancement' deep dive worksheet in the supply model.

Scope adjustments (need for enhancement investment)

Scheme scope and investment in business plans must be justified against company WRMPs in the context of the need and benefit provided to the supply demand balance and have accurately and consistently requested costs.

South West Water and Wessex Water challenge the use of annual average WAFU benefit in the unit model stating that it does not accurately reflect the scale of an individual scheme, particularly where modular capacity is built in, or further benefit is brought in during critical periods. We continue to consider that we should apply annual average WAFU benefit consistently across schemes as this reflects the actual benefit received by customers across the planning horizon presented in WRMPs and business plans.

We agree with Anglian Water that, for two schemes where the water available for use (WAFU) benefit in its WRMP varies across its planning horizon, to align the benefit with the highest value.

Our assessments are set out on the 'Scope adjustments' deep dive worksheet in the supply model.

Best value and optioneering (best option for customers)

In our draft determination we applied a 10% cost challenge where, at the WRMP 2024 Statement of Response stage, we held a residual concern about a company's optioneering and decision-making process. This applied only to high-complexity options that are not assessed through other means, such as gated programmes. Therefore, in our draft determination the only best value and optioneering adjustment we made was to South East Water's New Arlington Reservoir scheme.

For the final determination we reallocate New Arlington Reservoir to the Strategic Resource Options (SRO) model for assessment. Therefore, we do not make any best value adjustments to South East Water's supply schemes.

For the final determination we do not have a 'High' complexity category. The supply schemes which were in this category at draft determination now sit within the RAPID or large schemes gated process and no allowance was therefore being calculated in the supply unit cost model. Therefore, we do not make any additional best value and optioneering adjustments for the final determination.

Our assessments are set out on the 'Best Value' deep dive worksheet in the supply model.

RAPID Strategic Resource Options in house funding and delivery

In draft determination representations, Severn Trent Water proposed to deliver the Minworth scheme in-house, as opposed to through Direct procurement for customers (DPC) route. In our final determinations we agree with the proposal, and therefore Minworth water recycling joins Teddington direct river abstraction as schemes in the RAPID programme which are to be delivered in-house. Further details on this determination are provided in section 3.6.3.

In our final determinations, both Minworth water recycling schemes and Teddington direct river abstraction have allowances provided through our supply model, as a result of the in-house delivery. Due to the oversight and scrutiny the RAPID programme provides these schemes, the costs are allowed in full and are not included in the modelled efficiency challenge.

In response to North East Lincolnshire Council and WRE, for the final determination we include Anglian Water's Mablethorpe desalination scheme in the RAPID gated programme. Further details on this determination are provided in the 'PR24 final determinations: Major Projects development and delivery' appendix.

In response to Sussex North authorities, for the final determination, we retain our draft determination approach and apply a DPC allowance for Southern Water's Littlehampton and Medway (previously Ford and Aylesford) schemes in the Supply enhancement model.

In our final determinations, we also continue to categorise some supply schemes under 'large schemes for enhanced engagement or for allowances to be provided through a gated process. This includes schemes that have been rejected from the DPC delivery mechanism, or have been identified through our deep dive assessment of supply schemes. Further information on our approach to large schemes can be found in section 4.7.3 and in the 'Large Schemes' deep dive in our supply model. For final determinations, schemes that are included in the large scheme gated programme have been allowed a development allowance only in our supply model, calculated as a proportion of the total requested scheme cost.

Thames Water – additional resilience uplift

In our draft determination we allowed Thames Water £67 million to deliver an additional 18.06 Ml/d of supply benefit over the 2025–2030 period to address the resilience shortcomings in the company's revised draft WRMP. The company planned to reduce the temporary use ban (TUB) level of service for customers to 1-in-10 years and is not yet achieving 1-in-200 resilience against emergency drought orders. We calculated the allowance using our modelled unit cost rate for options of a medium complexity, and the benefit difference the company provides between the higher (1-in-20 year) and lower (1-in-10 year) TUB level of service. With this allowance we expect Thames Water to deliver a higher level of service for

TUBs than it is currently planning for in future WRMPs and an improved (faster) glidepath to 1-in-200 years emergency drought order resilience.

For the final determination, we maintain our approach to the Thames uplift allowance, including utilising the modelled medium unit cost rate to set the uplift. The uplift has been recalculated at £71.7 million with the updated medium unit cost for final determinations.

Southern Water – drought resilience uplift

In its representation, Southern Water included a new scheme for Extreme Drought Resilience. The company states that this scheme will deliver 45 Ml/d benefit to the supply demand balance and offset the use of other drought options during severe drought events between the years 2030–2034, before other large SROs come online. The company is currently reconsulting on its revised draft WRMP24 (rdWRMP24). This includes the 'Extreme Drought Resilience' scheme selected in its preferred plan for the first time. There is uncertainty that the scheme is the best option ahead of stakeholders returning consultation responses.

For final determinations, we provide an allowance for Southern Water which is sufficient to allow the company to develop a scheme to address the temporary need demonstrated in its WRMP. Southern Water's rdWRMP24 tables demonstrate that without the 45 Ml/d 'Extreme Drought Resilience' scheme, a deficit of up to 7 Ml/d would remain in its Southampton West WRZ, and the company would need to adopt and utilise other additional drought options. We allow £27.8 million to the company to deliver supply schemes that resolves at least the 7 Ml/d of risk to Southern Water's Southampton West WRZ. The allowance should also allow Southern Water to endeavour to deliver supply benefit that offsets the need of any additional drought options that are otherwise offset by the current 'Extreme Drought Resilience' scheme. For the purposes of calculating an allowance, we have used our medium-complexity modelled unit cost rate for 7 Ml/d benefit to allow sufficient funding for Southern Water to address the needs set out in this section.

Our final determination

Companies requested in their representations nearly £1.8 billion against WRMP supply schemes (after reallocations, pre-frontier shift and pre-contingency) with our final determination allowance being over £1.2 billion (pre-frontier shift and pre-contingency). This allowance is an increase from draft determinations which allowed almost £1.0 billion for supply schemes (pre-frontier shift and pre-contingency). The increase is predominantly as a result of companies increasing their investment requests between draft and final determinations (at draft determinations, companies requested almost £1.5 billion against supply schemes (after reallocations, pre-frontier shift and pre-contingency). The PR24 final determination allowance is also an increase from PR19 final determination which allowed companies over £0.2 billion for this supply scheme area of enhancement. This increase is a reflection of the increased water resource challenges at expected for the 2025–2030 period

and beyond, including increased environmental protection, climate change and resilience, and population and business growth.

For the final determination, our approach to establishing efficient expenditure remains underpinned by unit cost benchmarking of supply schemes across the industry. We use forecast scheme costs and benefits to determine unit costs. Outliers to forecast input data were checked and validated with further assessment of the scheme type and benefits. Our approach uses multiple complexity categories based on engineering rationale of scheme types and scope, as this accommodates the cost associated with increasing infrastructure complexity and new assets of different supply scheme interventions. This also recognises the step change in balancing supply and demand at WRMP24 and the subsequent complexity of schemes required to address the challenge. For the final determination supply schemes are split into four complexity categories. We no longer use the 'High' category presented in our draft determination as the supply schemes which were in this category at draft determination now sit within either the RAPID or large schemes gated process.

Table 23: Supply scheme complexity categorisation used for benchmarking

Complexity category	Category description	Examples of scheme types	Unit cost (£m per Ml/d)
Very Low	Options utilising existing available water supplies, and/or have no infrastructure or predominantly existing infrastructure needs	Licence trading (little enabling infrastructure needs)	0.071
Low	Options which utilise existing available water supplies, and/or existing infrastructure	Licence trading (some enabling infrastructure needs) Transfers (with mostly existing infrastructure) Network enhancements	0.710
Medium	Options with majority/ entirety new infrastructure and new water supplies	Transfers Groundwater and surface water abstractions	3.972
Infrastructure schemes with high level of base overlap	Infrastructure options which have significant overlap with base activities and costs	Water treatment schemes	4.491

For the final determination we continue to set the efficient cost based on the median unit cost per Ml/d of scheme benefit within each scheme complexity category. We have updated unit costs to reflect updates to company costs in representations and a reassessment of scheme scope which has led to some changes in scheme categorisation.

Some investments may span multiple price control periods, notably where schemes take longer than five years to construct. For schemes that were part funded at PR19 and that companies have requested further funding to complete we apply the criteria as outlined in

the PR24 methodology¹¹⁶. We have assumed the funded proportion of the scheme is to be delivered during 2020–25 as forecast. The remaining proportion of the scheme is then funded at the efficient cost. This way, companies are exposed to cost sharing on the proportion of scheme expenditure covered in the 2025–30 period. For new schemes that cross price review periods we fund the proportion of scheme costs requested at the efficient cost benchmark. We will hold companies to delivering the proportion funded at future price reviews.

For the final determination, to protect customers, we continue to assess company expenditure proposals so that enhancement expenditure is properly justified and reflects the needs cases in the WRMPs. These assessments include:

- Non-delivery assessment: This assessment determines the PR24 investment request does not overlap with previously funded activities at PR19, to ensure customers do not pay;
- Scope (needs case) assessment: This assessment determines the needs case for investment is sufficiently and convincingly evidenced. In the case of supply schemes, the needs case is predominantly justified in company's WRMPs against forecast deficits in supply demand balance. For example, we make adjustments or reallocations if WAFU is: not represented against a WRMP scheme, being double counted across schemes, or not contributing to WRZ or company level supply demand balances.
- Enhancement assessment: This assessment determines if the scheme or activity is justified as enhancement expenditure, and is not considered base expenditure. For example, we make adjustments if activities are predominantly to associated with planning or asset management.
- Adaptive pathway assessment: This assessment determines the investment needs case for preparatory work for uncertain futures is sufficiently and convincingly evidenced against the criteria set out in the PR24 final methodology¹¹⁷.

3.6.2 Supply interconnectors

What we said in our draft determinations

We benchmarked the cost efficiency of supply interconnectors consistently across the industry and used econometric modelling to set allowances using WAFU benefit and length as model variables. We used both historical outturn (from company annual performance report (APR) submissions) and forecast scheme costs and benefits to determine unit costs. Our analysis of outturn data demonstrated a good fit against forecast costs and its inclusion in the cost models strengthened the benchmark's statistical significance. Outliers within the outturn and forecast input data were checked and validated with further assessment of the scheme type and benefits.

¹¹⁶ Ofwat, PR24 Final Methodology, Appendix 9: Setting expenditure allowances, pg. 110–112

¹¹⁷ Ofwat, PR24 Final Methodology, Appendix 9: Setting expenditure allowances, pg. 112–113

In the draft determination we allowed companies £986.5 million to deliver supply interconnectors to address water supply and demand balance issues, which was 6% lower than what companies requested in their business plans.

Stakeholders' representations

Companies' representations on supply interconnectors can broadly be categorised into the following areas:

Data and approach

Anglian Water highlights that we should update the Supply Interconnectors model to include the latest year of available historical data (from APR24) and the updated forecast costs (submitted as part of companies' representations). Anglian Water supported our draft determination decision to include additional WFD and resilience schemes in the forecast model as additional datapoints.

Affinity Water states that forecast datapoints (i.e. including WFD and resilience schemes) should be used in the calculation of the log bias uplift and therefore allowances, rather than just used as datapoints in the regression model that then don't feed into the calculation of allowances.

Northumbrian Water has stated in its representation that the equal weighting on the forecast and outturn model data means that Anglian Water has undue influence on the cost benchmark, with Anglian Water having a high unit cost in relation to benefit delivered (£m per MI/d) in its outturn data. The company states that equal weighting of forecast and outturn model therefore means penalising companies that have a high WAFU benefit unit cost but low length unit cost (£m / km) as the coefficient on benefit is larger. As a result, Northumbrian Water suggest putting more weight on the forecast model compared to the outturn model, or to only use the outturn model for cross-checking.

Affinity Water and Anglian Water provided representations on our approach to applying pre-adjusted efficiency scores and the log bias correction in the supply interconnector model. The companies state that applying efficiency scores for the log bias uplift by adjusting unadjusted allowances for 2025-30 spend, and comparing this to 2025-30 spend, was incorrect when total costs had been used in the regression model.

Scheme cost and benefit

Anglian Water has increased the total cost of its supply interconnector programme by 33%, citing material and activity cost increases as revealed by the outturn delivery of its current PR19 interconnector programme.

Southern Water has significantly revised the costs and benefits of its supply interconnector programme in its draft determination representations as a result of changed scheme scope. We have updated the model to include the new costs and benefits, and assessed the new scope to ensure the new costs and benefits are justified for the enhancement and needs cases.

At draft determinations, due to concerns around duplicating WAFU benefit, we combined some of Anglian Water's supply interconnector schemes. Anglian Water stated in its representation that it has no issue with this approach. We also combined two of Northumbrian Water's supply interconnectors schemes for similar concerns. The company has not provided additional evidence on this in its representation.

Anglian Water has stated in its representation that capacity, as opposed to WAFU benefit, should be considered as the comparator for scheme cost. South West Water also state that WAFU benefit is not a good comparator, and its one scheme should be used in a length-only model.

Scheme scope and complexity

Affinity Water and Anglian Water highlight that we need to consider other variables that contribute to the cost of building interconnectors, including the number and length of crossings. Affinity Water and Anglian Water state that some interconnectors are more costly due to crossings (roads, rivers, environmental, utility etc.) and the model does not account for this, but should factor this in.

Anglian Water also raised two aspects of interconnector scheme costs that it considers are not accounted for in the Supply Interconnectors model, namely pipe material and, specifically in respect of its Grafham to Bury interconnector, mid-transfer treatment.

Supply interconnector reallocations

In the draft determination, we reallocated South East Water's supply interconnector schemes to resilience for assessment. In its representation the company states that its sub-zonal interconnectors are not included to improve resilience and should not be subject to a resilience assessment.

We also reallocated one Anglian Water scheme and one Northumbrian Water scheme to resilience interconnectors at draft determinations. In Anglian Water's representation, it has removed the scheme from the supply interconnectors enhancement line. Northumbrian Water has provided additional evidence on the WAFU benefit of its scheme.

At draft determinations, Severn Trent Water's 'Carsington to Tittesworth main' supply interconnector scheme was due to be delivered through direct procurement for customers (DPC) mechanism, and therefore not assessed through the supply interconnector model. In

its representation, Severn Trent Water has stated this scheme is more suited to be delivered in house.

Southern Water and Affinity Water have provided representation that it agrees with our draft determination reallocation of its scheme from supply interconnectors to supply as a result of the scheme scope being more suited to be benchmarked and allowances determined through this model.

Other points raised in representations:

Companies provided some specific feedback in representations on points raised in our draft determination deep dives assessments. We summarise these and respond to evidence provided in representations in our deep dive assessments for final determination. These can be found within the supply interconnectors enhancement model.

We also received representations from non-water company stakeholders. Water Resources East (WRE) highlight the 'strategically important' Grafham to Bury St Edmunds transfer scheme. WRE raise that the draft determination imposes a significant cost challenge.

Our assessment and reasons

Data and approach

We reject Northumbrian Water's representation to exclude (or provide lower weighting to) outturn data in our model. We want to challenge company forecast costs by placing equal weighting on outturn costs. Further explanation on this decision (and other model process-related representations) can be found in the 'PR24 final determination – Expenditure allowances – Enhancement cost modelling appendix' (section 8.2.3).

Affinity Water and Anglian Water represented on the inclusion of WFD and resilience schemes as data points in the model. We have revisited our draft determination proposal and for final determination have excluded these data points on the grounds of being consistent with using comparable WAFU benefit to benchmark across schemes. Further explanation on this decision (and other model process-related representations) can be found in the 'PR24 final determination – Expenditure allowances – Enhancement cost modelling appendix' (section 8).

Affinity Water's representation on this is largely to do with how we perform the log bias adjustment, which we address below. However, more broadly, we have also revisited the proposal we made at draft determinations to include WFD and resilience schemes in our interconnectors dataset. We now determine that we must be consistent across all companies and only use WAFU to capture the customer needs case and therefore take these additional schemes out of the model dataset.

We accept the representations from Affinity Water and Anglian Water on application of log bias, and have updated the log bias adjustment so that it is consistent with the application in other areas. This is explained in more detail in the supply interconnectors chapter in 'PR24 final determinations: Expenditure allowances – Enhancement cost modelling appendix' (section 8.2.2).

Cost and benefit

In its draft determination representation, Anglian Water has increased its forecast interconnector programme total costs by over £200m (over £80m increase over 2025–2030), representing a total programme cost increase of 33% from draft determinations. The company has cited evidence of increased PR19 outturn costs in delivering its PR19 interconnector programme, with drivers including costs of materials, labour, and development and delivery activity complexities. However, we note that this forecast cost increase is larger than the APR interconnector outturn cost increase of around 25%, and little specific scheme by scheme justification is provided for the increase in forecast costs. We have incorporated the increased costs into the model to ensure these are benchmarked for efficiency. We remain concerned around the increased costs and have included five of Anglian Water's ten supply interconnectors into our 'enhanced engagement' oversight mechanism for large projects to provide certainty and scrutiny to projects scope, cost and delivery. We also note that the scope and subsequent cost increase of Southern Water's Southampton Link Main supply interconnector justifies inclusion in the 'enhanced engagement' oversight mechanism. Further information on approach to large project oversight can be found in section 4.7.3.

We reject South West Water's suggestion to exclude WAFU as an explanatory variable, and Anglian Water's representation to utilize capacity over WAFU. WAFU benefit and length remain the independent variables that give the best indication of efficiency and benefit to customers that they have funded. Further explanation on this decision (and other model process-related representations) can be found in the 'PR24 final determination: Expenditure allowances – Enhancement cost modelling appendix' (section 8.2).

At draft determinations, we combined two sets of Anglian Water's supply interconnector schemes where we determined that the WAFU benefit added to the supply demand balance was the same throughout all the adjoining schemes. This prevented the model from double counting the benefit and therefore influencing the allowance. Anglian Water stated in its representation that it has no issue with this approach. We also determined that two of Northumbrian Water's supply interconnectors duplicated benefit, and combined the interconnector schemes. The company has not provided additional evidence on this in its representation. We have therefore retained our draft determination approach at final determination for both companies.

Crossings and materials

We accept the case put forward by Affinity Water and Anglian Water that additional crossings can increase scheme complexity and cost. We queried companies to gather additional information on crossings in their interconnectors routes, and have provided a post-modelling uplift where the increased costs were not covered by the models efficiency challenge. Further explanation on this decision (and other model process-related representations) can be found in the 'PR24 final determination: Expenditure allowances – Enhancement cost modelling appendix' (section 8).

We accept the case proposed by Anglian Water for providing an uplift for steel construction for the Grafham transfer, based on the justification of improved resilience and maintenance. We collected additional data to identify the additional costs of steel construction compared to other pipe materials to determine the uplift. Further explanation on this decision (and other model process-related representations) can be found in the 'PR24 final determination: Expenditure allowances – Enhancement cost modelling appendix' (section 8). We also include the use of the steel material as a specific condition to Anglian Water's supply interconnector PCD to ensure customers realise the resilience benefits of the material, and are subsequently protected if steel is not used.

Scheme reallocations

For final determinations, we disagreed with South East Water's representation to include its interconnector programme in the supply interconnectors model, and therefore retain our draft determination decision to reallocate seven schemes to resilience. This is due to concern that the benefit stated is related to a sub-zonal deficit created by licence reduction drivers, as opposed to WAFU generated by the schemes themselves, which has then been added to a zonal and company level supply demand balance. It is important that we benchmark schemes of comparable drivers and therefore scale, scope and cost, so that we do not risk underfunding other schemes that fall under supply interconnectors presented in WRMPs. The seven schemes have therefore assessed under resilience, with further information provided in the resilience model deep dive 'SEW_2'.

Northumbrian Water provided additional evidence in its representation on the WAFU benefit of the 'Bungay to Barsham pipeline' scheme and thus why it is a supply, as opposed to resilience, interconnector. It stated the scheme was required to bring supply from a new groundwater source to demand zones via treatment in order to fully realise the WAFU benefit from the new source. For final determination we agree that the scheme should remain in supply interconnectors.

In its draft determination representation, Anglian Water removed its interconnector scheme 'East Suffolk WRZ IPZ' from its supply interconnector lines. We therefore have retained our draft determination decision to assess the scheme under resilience.

In their draft determination representations, Southern Water and Affinity Water agreed that their interconnector schemes 'Transfer: Utilise full existing KME-KTZ transfer capacity

(9Ml/d)', 'The Grove valve – Licence Re-Location BPS transfer' and 'Midway North BPS upgrade' did not meet the requirement for supply interconnectors and should be assessed as supply schemes in the respective model. We therefore retain our approach from draft determination in the final determination.

Our final determination

Supply interconnectors are schemes which transfer water between companies' water resource zones and which provide a measurable zonal water available for use (WAFU) benefit to companies' supply demand balance. Supply interconnectors and their benefits are set out and justified in the company WRMPs.

For the final determination we continue to benchmark the cost efficiency of these schemes consistently across the industry and use econometric modelling to set allowances using WAFU benefit and length as model variables. We use both outturn (from company APR submissions) and forecasts scheme costs and benefits to determine unit costs. For the final determination we include the latest year of available historic data (from APR24) and the updated forecast costs (submitted as part of companies' representations) in our model.

The approach to determining allowances for final determinations is set out below.

Econometric modelling

For the final determination we continue to benchmark the cost efficiency of these schemes consistently across the industry. We have applied an econometric modelling approach, as at draft determinations, to set benchmark the schemes and determine efficient allowances. The model utilises scheme WAFU benefit and pipeline length as model variables, as these were the strongest cost drivers. We use both outturn (from company APR submissions) and forecasts scheme costs, benefits and lengths to benchmark and determine efficient costs. For the final determination we also include the latest year of available historic data (from APR24) and the updated forecast costs submitted as part of companies' representations in our model. In a change from draft determinations, we have not included WFD and resilience schemes in the model benchmarking for final determinations, as it was not clear these schemes could be easily compared to supply interconnectors in the context of WAFU benefit provided.

As scheme scopes, costs and benefits were updated for final determinations, we re-ran Cook's distance outlier test to identify outlier schemes, and queried companies to understand further details on schemes that were identified through this process. To be consistent with other areas, we now remove these Cook's distance outliers from the model.

We have provided post modelling adjustments where companies had greater than average length of crossings in their schemes, as well as to uplift for the additional cost of steel and mid transfer treatment for the Grafham pipe.

Further explanation on econometric modelling for supply interconnectors (and model process-related representations) can be found in the 'PR24 final determination – Expenditure allowances: Enhancement cost modelling appendix' (section 8).

Other assessments

For the final determination, to protect customers, we continue to assess company expenditure proposals so that enhancement expenditure is properly justified and reflects the needs cases in the WRMPs. These assessments include:

- **Non-delivery assessment:** This assessment determines the PR24 investment request does not overlap with previously funded activities at PR19, to ensure customers do not pay;
- **Scope (needs case) assessment:** This assessment determines the needs case for investment is sufficiently and convincingly evidenced. In the case of supply interconnector schemes, the needs case is predominantly justified in company's WRMPs against forecast deficits in supply demand balance. For example, we make adjustments or reallocations if WAFU is: not represented against a WRMP scheme, being double counted across schemes, or not contributing to WRZ or company level supply demand balances.
- **Enhancement assessment:** This assessment determines if the scheme or activity is justified as enhancement expenditure, and is not considered base expenditure. For example, we make adjustments if activities are predominantly associated with planning or asset management.

Final allowances

Companies requested in their representations nearly £1.4 billion against WRMP supply interconnector schemes (after reallocations). Our final determination allowance is set at over £1.3 billion. This is an increase from PR19 final determination which allowed companies almost £0.4 billion for this area of enhancement. This increase is a reflection of the increased water resource challenges at expected for the 2025-2030 period and beyond, including increased environmental protection, climate change and resilience, and population and business growth.

Table 24: Water supply related spend which includes supply and supply interconnectors delivering supply-demand balance WAFU benefits

Company	Supply allowance (£m) - including contingent funding	Supply interconnectors allowance (£m)	Total allowance (£m)	WAFU benefit delivered during 2025-30, Ml/d ¹¹⁸
Anglian Water	281.75	616.92	898.67	0.00
Dŵr Cymru	1.10	46.30	47.40	39.60
Hafren Dyfrdwy	0.00	0.00	0.00	-

¹¹⁸ A significant proportion of the investment funded in supply enhancement delivers supply-demand balance WAFU benefit after 2029-30.

Northumbrian Water	223.54	131.97	355.51	50.99
Severn Trent Water	307.00	269.28	576.28	111.59
South West Water	14.21	9.25	23.46	0.00
Southern Water	519.45	181.74	701.19	11.50
Thames Water	189.84	0.00	189.84	43.36
United Utilities	0.00	0.00	0.00	-
Wessex Water	10.29	0.00	10.29	0.00
Yorkshire Water	37.19	0.00	37.19	21.30
Affinity Water	22.79	56.27	79.06	20.00
Bristol Water	0.00	0.00	0.00	-
Portsmouth Water	0.00	0.00	0.00	-
South East Water	3.96	0.00	3.96	0.00
South Staffs Water	17.43	0.00	17.43	0.40
SES Water	0.00	0.00	0.00	-
Total	1,628.56	1,311.74	2,940.29	348.92

3.6.3 Strategic resource options

What we said in our draft determinations

At draft determinations, we facilitated water companies to respond to environmental and drought resilience challenges by allowing funding for water companies to continue to develop existing strategic resource options from PR19 as well as allowing the funding for the development of new strategic resource options.

We allowed water companies up to £1.2 billion over the 2025–30 period, split between baseline and contingent funding, across a portfolio of 21 SROs following the removal and addition of solutions. This was an increase on PR19 which allowed companies £553.7 million (2022–23 prices) across 17 SROs. As part of this funding, we provided companies with an uplift to their proposed Direct Procurement for Customers (DPC) costs, based on experience from our DPC pathfinder projects HARP and Cwm Taf. This reflected our aim that projects were suitably funded and developed to reduce risks in the future.

We proposed a change to cost sharing rates, applying 40:40 to baseline funding allowances and 25:25 to contingent funding. This was to strike a balance between incentives to develop projects efficiently and the additional uncertainty in developing major projects. This was a change from the 50:50 that we had previously applied at PR19.

Stakeholders' representations

We have categorised company representations into five areas: baseline and contingent funding, cost sharing, development costs for new SROs, DPC development costs and planning issues.

Baseline and contingent funding

Seven companies raised concerns on our approach to baseline and contingent funding:

- South West Water, Southern Water, Wessex Water and Yorkshire Water agreed with our proposals. Yorkshire Water stated that the approach to contingent funding struck a fair balance in addressing uncertainty. South East Water stated that the proposed higher rate for contingent costs is helpful in principle and reflects the uncertainty of the development phase.
- South East Water, Thames Water and Anglian Water expressed concern that our approach to contingent funding could create significant challenges from a cashflow and financeability perspective. They explained contingent funding could create significant funding gaps between when costs were incurred and when costs were recovered. Anglian Water raised this as a point of concern for the Fens and Lincolnshire Reservoirs.
- Anglian Water raised concerns that categorising some areas of allowance as contingent did not recognise that procurement and enabling works activities run concurrently to the development consent order (DCO) examination process.

Cost sharing

Four companies disagreed with our positions on cost sharing:

- Anglian Water suggested that cost sharing places excessive risk on companies and does not reflect the risk involved when developing infrastructure of this scale. It suggested that its' SROs proceed via a separate price control process.
- Wessex Water and South West Water raised concerns about the 25:25 cost sharing of the contingent funding element. These concerns reflected the uncertainty surrounding these costs. They suggested an alternative approach of treating these costs as "pass-through" costs at actual cost, subject to a review and pre-approval of the claim.
- Thames Water expressed concern that cost sharing incentivises minimising development expenditure, rather than incentivising front-end investment to minimise the delivery phase risks. It suggested that this may drive up the cost of capital and would not lead to long term value for customers if projects are not derisked earlier on in their lifecycle.

Development costs for new SROs

Four companies raised concerns on our approach to development funding for SROs:

- Northumbrian Water and Yorkshire Water generally accepted our proposal to reduce the development cost benchmark for new SROs from 6% to 5.5% for development activities between Gates 1-4. However, Northumbrian Water stated that Ofwat's benchmarking used a limited sample of schemes with a wide difference in scope. It stated that this may underestimate development funding for more complex SROs.
- Yorkshire Water challenged our policy that early gate investigations are largely base funding due to size, complexity and novel aspects of the projects. It disagreed with the proposal to disallow funding for early gate developments as it believed this would be a disincentive to explore development options.
- South East Water disagreed with our proposal. It stated that capex estimates are uncertain for new SROs, as early-stage estimates increase materially as projects mature. It was also concerned that our approach which assumed a consistent percentage allowance for all projects, disregarded other factors that could impact development costs.
- Thames Water did not regard the 5.5% development funding allowance to be sufficient to derisk the delivery phase of new solutions.

DPC development costs

Two companies raised concerns with the funding approach for DPC development costs:

- South West Water and Wessex Water expressed concern that there is an overlap between DPC development costs and DPC incentives. They stated that it would be beneficial if a similar approach to DPC development expenditure was considered. It recommended the carry-over of underspend from one stage to the next and using a portfolio approach similar to DPC incentives.

Hampshire Water Transfer and Water Recycling (HWTWRP) Project

Four non-water company stakeholders wrote to us to raise concerns regarding the Hampshire Water Transfer and Water Recycling (HWTWR) project. Stakeholders suggested that while they recognised the need for water supply, they disagreed with this proposed project. This is for a variety of reasons including:

- The need for the HWTWRP has not been appropriately made, and there are alternative projects possible which have not been considered by Southern Water;
- the Public Consultation undertaken by Southern Water on the HWTWRP was flawed and that the consultation failed to comply with specific principles;
- the project has high energy requirements, contradicting policies to reduce greenhouse gas emissions;
- the project is very costly, with costs rising to over £1 billion, and is inefficient since the recycling plant will need to run continuously;
- the scheme would be harmful to river catchments, and does not provide best value for customers or the environment.

Respondents expressed that Ofwat's funding mechanism should be changed to promote more sustainable solutions and that the project should be removed and be subject to a thorough review.

Our assessment and reasons

After considering the feedback from companies, we have changed our policy positions on baseline and contingent funding, cost sharing, and development costs for new solutions. We have also proposed an amendment to our approach on calculating DPC development costs:

Baseline and contingent funding. For the final determinations we are no longer setting both baseline and contingent funding. Setting separate baseline and contingent allowances could create financeability concerns and lead to delays in progression of SROs. We are therefore allowing all companies upfront funding for all costs, with the exception of Thames Water who suggested a proportion of proposed costs remained uncertain. We anticipate that any unexpected changes causing alterations to costs will be addressed through our new uncertainty mechanism, as detailed in 'PR24 final determinations – Major Projects development and delivery appendix'.

Cost sharing. For the final determination there will be no cost sharing on SROs. Instead, we are providing a "use it or lose it" funding allowance. This approach entails a full clawback of any underspend from companies back to customers, while overspend will be covered by sponsor companies if incurred as a result of circumstances that requires additional expenditure which has not been agreed by Ofwat. To ensure accountability, all expenditures will undergo thorough scrutiny as part of the RAPID process. This will remove incentives for companies to reduce development expenditure, which could potentially cause delays as well as increasing long-term project costs. Our uncertainty mechanism will allow the recovery of costs arising from scope changes or companies to bring forward expenditure that had been assumed to have been done by a different party such as an Infrastructure Provider (IP). Expenditure will be subject to the RAPID gated process and requires the assessment of the evidence for any additional costs.

Development funding. We are providing funding for schemes based on their current maturity, solution type and whether they are a new or existing SRO. This is summarised by the following table whereby the percentages correspond to % of capex:

Table 25: Summary of development funding allowances minimum and maximum as a % of capex

Project Type	Development Funding Minimum	Development Funding Maximum
Existing SRO (excluding water recycling schemes and capex exceeding £350m)	0%	10%
New SRO (capex exceeding £350m)	6%	10%

New SRO (capex less than £350m)	8%	10%
Water recycling schemes	10%	12%

This builds on our draft determination approach by providing new SROs with a greater allowance, increasing the scale of funding for existing SROs and providing reuse projects with greater allowance recognising the associated complexity. This is in line with the additional funding requests from companies in response to the challenges we set out which encouraged companies to take steps in their schemes early on to reduce the risk of delays.

This approach ensures that companies have sufficient funding to progress their SROs by providing new SRO with a minimum of 6% of capex, alleviating some company concerns.

We find that the majority of development allowance requests fall under this approach which we have developed via benchmarking of projects such as those found in the energy sector or other large UK infrastructure projects.

We have not allowed any funding requests put forward by companies which do not directly relate to their development of SRO's. Specifically, Southern Water have requested funding of £82 million, as part of the HWTWRP project and on behalf of Portsmouth Water, in relation to risk associated with the development of Havant Thicket reservoir. This is dealt with through a separate mechanism.

DPC development costs. We are amending our approach to the calculation whole life costs within the DPC methodology and the profiling of allowances. To align with the totex definition under the reward and penalty framework set out in the new 'Major Projects' incentive, we will be capping the whole life cost at 25 years. Additionally, DPC development allowances will only be profiled across DPC Stages 2 to 4 compared to Stages 1 to 4 previously as companies are expected to reach the first stage by April 2025.

We recognise that Southern Water and South East Water have put forward cost requests in relation to CAP management activities post DPC Stage 4. These costs can only be determined once there is clarity on the commercial structure of the relationship that needs to be managed and will be dealt with through a separate reconciliation process at PR29. We have therefore disallowed these costs.

Hampshire Water Transfer and Water Recycling (HWTWR). Southern Water are under legal requirements to provide a major new source of water to address the abstraction licence reductions on the River Test and River Itchen. It is for the statutory water resources management planning process to determine the best value means for addressing the need. Any scheme is also subject to examination under the statutory land use planning framework. Ofwat is not the decision maker with respect to these processes. We consider that the points raised are matters for the statutory planning processes to consider along with the views of other stakeholders.

In line with the with the outcomes of the planning process, we therefore continue to provide development funding for the project, which will allow Southern Water to collect the technical and environmental evidence to ensure that a solution can be implemented.

Our final determination

Our final determinations provide allowances of £2.1 billion to fund pre-construction development, land acquisition, enabling works and commercial and procurement strategy. Our allowances are made up of three elements:

- Development expenditure: This includes project and programme management; engineering, design and site investigations; environmental/water quality investigations; and stakeholder engagement and planning. This is calculated as between 0-12% of total capex costs.
- Commercial and procurement strategy: Including developing the commercial arrangements to deliver the project through DPC or SIPR. For DPC, this is calculated as 0.55% of whole life costs capped at 25 years plus a £9 million minimum allowance; and
- Early construction activities: This includes acquiring land rights necessary for the project to be delivered; any enabling works and delivering any interface works to be completed in the 2025-30 period.

Table 26: Final determination development cost allowances by company for major projects in the 2025-30 period (£million, 2022-23 prices)

Company	Total (£million, 2022-23 prices)
Anglian Water	810.50
Northumbrian Water	48.66
Southern Water	243.36
Severn Trent	103.41
South West Water	86.82
Thames Water ¹¹⁹	473.95
United Utilities	32.43
Wessex Water	68.15
Yorkshire Water	68.96
Affinity Water	66.20
South East Water	72.31
Total	2,074.75

¹¹⁹ Thames Water have asked for an uncertainty mechanism to fund a further £363.97 million of land and delivery costs across their portfolio.

3.6.4 Leakage

Companies will deliver a leakage reduction of 17% over the 2025–30 period. This is on the glidepath to meet the long-term target of a 50% reduction by 2050 (from 2017–18 levels)¹²⁰. Leakage is a priority for customers and an important component of the water supply and demand balance. This balance needs to be maintained to achieve resilience in drought periods while allowing reductions in abstraction to improve the environment.

What we said in our draft determinations

Leakage reductions can be delivered through three main activities: mains renewal; addressing customer supply pipe leakage (CSPL); and other leakage activities (such as active leakage control and pressure management). We assessed the costs of these activities separately as mains renewals is a significantly more expensive intervention to address leakage.

In setting draft determination allowances for mains renewals for leakage reduction, we adjusted company proposals to account for mains renewal funded through base allowances. We proposed funding the residual length of mains renewal as a leakage enhancement activity using a mains renewal unit cost. Mains renewal unit costs were determined as part of the base mains renewal analysis.

CSPL is closely linked to metering as putting in meters helps identify customer supply pipe leakage. Companies either included CSPL reduction costs within their smart metering programmes or within leakage enhancement. For consistency, where CSPL was included in leakage enhancement, we reallocated this cost to metering enhancement.

To avoid customers paying twice, we proposed to only allow funding for additional leakage reductions beyond those set out in the 2019 price review. We proposed funding the full additional leakage reduction over the 2025–30 period through leakage enhancement after accounting for savings from mains renewal and CSPL. This change in approach from PR19 provided enhancement allowances for leakage reductions that some companies assumed would be delivered through base allowances in their business plans.¹²¹

We calculated leakage reduction unit costs for "other leakage activities" (i.e. not mains renewal or CSPL) from historical cost information from 2019–20 and 2021–22. These years were chosen as we sought to avoid distortions in leakage costs and reductions or increases

¹²⁰ [Reducing Leakage – Ofwat](#)

¹²¹ At PR19 we expected significant leakage reductions to be delivered base expenditure as there had been little reduction over the previous 20 years despite significant technological improvements. In the PR19 final determinations we only made enhancement allowances to those companies going beyond normalised upper quartile performance.

from extended hot weather conditions. We used the median efficient unit cost benchmark of £1.1 million per Ml/d. We calculated allowances by applying the efficient cost benchmark to the volume of leakage reduction.

A few companies received more enhancement expenditure allowances than requested in their business plans given our change in policy to funding leakage reductions through enhancement. To derive leakage enhancement costs, we used the median in the unit cost benchmark. By definition, this means some companies will receive more in this enhancement area.

Stakeholders' representations

Key themes in the company representations are:

Leakage reductions to be funded

- Northumbrian Water, United Utilities, Affinity Water, and South Staffs Water supported reductions in leakage being funded as enhancement.
- Both Anglian Water and Portsmouth Water oppose the application of a clawback of PR24 enhancement allowances as this represents a double-counting with PR19 underperformance payments. Portsmouth water consider that the £1.2m removed for AMP7 under delivery, should be added back to its determination as failure to meet leakage targets is already penalised within its PR19 ODIs together with a cost sharing for under spend in totex.
- Yorkshire request that the £1.3 million adjustment is removed to reflect expected full delivery of the 15% leakage reduction in AMP7. It states that this means any applied reduction in enhancement funding should result in no underperformance payment for PR19 leakage performance.
- Yorkshire Water state there is a misunderstanding within the draft determination model. The company are requesting an allowance to reduce leakage from 268 Ml/d to 229.6 Ml/d not from the 2025 outturn position.
- Dŵr Cymru set out additional leakage enhancement required to achieve the PCL set out in draft determination but state it is not part of its post draft determination plan and do not consider it to be in the best interest of customers.

Reallocations of costs

- Anglian Water and South West Water raise concerns over the allocation of customer supply pipe leakage costs (CSPL) to metering. They state that the CSPL costs were associated with leakage activities, and that the costs were separate to metering.
- South West Water state that Ofwat have not provided funding for 3.17 Ml/d of leakage reduction to be delivered via its smart metering programme.

Leakage unit cost

- Anglian Water, Southern Water, South West Water, Thames Water, Welsh Water, Wessex Water, Yorkshire Water, Bristol Water, and South East Water raise concerns over the methodology used to calculate the leakage reduction unit rate.
- Companies state that the proposed leakage reduction unit rate of £1.1 million per MI/d is insufficient, particularly when compared to the PR19 allowance of £2 million per MI/d (adjusted to £2.4 million for 2022-23 prices). Companies quoted a third party which recommended an even higher unit cost of £3.2 million per MI/d.
- South West water argues that out the allowance for "other" leakage activity, incentivises short-term fixes over sustainable and long-term solutions.
- SES Water request that £6.3 million relating to its District Meters Areas Asset Health (DMAAH) programme is included to facilitate leakage reduction beyond 2030.

Mains renewal

- Anglian Water and Southern Water state that a single funding rate for mains renewal does not account for regional variations in labour costs or different replacement techniques. Anglian Water highlight the impact of pipe diameter on replacement costs and include benchmarking of different diameters of its costs against third party benchmarks. Southern Water states that it consider the mains unit rate calculated at draft determination (£292 per metre) only captures mains pipe replacement and not communication pipe replacement.
- Yorkshire Water raises concerns relating the impact of base mains renewal activity on its leakage reduction programme. The company states that if it replaces more than 0.205% of its network length in its base expenditure capital maintenance programme or the unit rate is less than £336k per kilometre it would re-optimize its leakage programme to deliver 295km less mains and 2.9 MI/d less leakage reduction.

We received sector wide representations from seven non-water companies. Four of these representations relate to sector wide issues:

- Wildlife and Countryside Link said Ofwat must share further detail setting out how we have determined that the draft determination allowance is 'sufficient for companies to deliver their WRMP metering ambition and related leakage and PCC targets'.
- The Environment Agency (EA) said there was generally good alignment in leakage ambition between the WRMP and the performance commitments but had concerns that enhancement allowances for leakage could create challenges for companies to achieve WRMP outcomes.
- Havant Climate Alliance and Havant Friends of the Earth stated more stretching short and long-term reduction targets are required, together with more funding and greater incentives for companies to tackle leakage.
- Water Resource South East (WRSE) said the cost estimation approach for leakage (in addition to metering and water efficiency) could be adjusted to incorporate more external factors.

Three of the non-water company representations relate to company specific issues.

- Water Resource East (WRE) said it is unrealistic to expect Anglian Water to meet stretching leakage targets including mains replacement through its base expenditure allowance.
- SES Water Customer Scrutiny Panel and Environmental Scrutiny Panel said the challenge to the SES Water's leakage allowance could have wider implications for the regions supply-demand balance, and that allowance for SES Water should be reconsidered.
- Veolia, a New Appointment and Variation company (NAV), said the proposed draft determination allowance for Wessex Water could hinder its ability to invest in necessary upgrades and advanced leakage detection technologies.

Our assessment and reasons

We have reviewed stakeholder representations to determine whether we need to change our approach to setting leakage enhancement allowances for the final determination.

Funded delivery of WRMPs and performance

Several representations (Wildlife and Countryside Link, Environment Agency, Havant Climate Alliance and Havant Friends of the Earth, SES Water Customer Scrutiny Panel and Environmental Scrutiny Panel) identify concerns with levels of funding to deliver WRMPs, achieving a supply-demand balance and more generally meeting performance targets.

Consistent with our view at draft determination, our funding allowances from base and enhancement will allow the companies to maintain and improve leakage performance aligned with forecasts in the latest WRMPs.

Our enhancement expenditure allowance for leakage reduction at draft determination was higher than at PR19. We have further increased our leakage reduction for the final determination. This signifies a step change in allowances for leakage performance delivery. This reflects our change in our approach compared to PR19 to fund the full leakage reduction over 2025-30 and separately allow costs for mains renewal. For final determinations we have further amended our approach to calculate leakage reduction costs based on the industry median using six years of outturn data, rather than two years used in draft determinations. We also note that a significant proportion of the leakage reductions will be delivered through the large scale metering programme for which we make enhancement allowances of £1.72 billion (compared to £1.70 billion requested). Overall we consider our allowances are sufficient for companies to deliver their WRMP targets and improved performance, if operating efficiently.

Leakage reductions to be funded

Consistent with the representations from Northumbrian Water, United Utilities, Affinity Water and South Staffs Water we continue to fund as enhancement the full leakage reduction over the 2025–30 period.

For final determination we no longer adjust the amount of leakage reduction funded through enhancement due to non-delivery in 2020–25 for Anglian Water or Portsmouth Water. We also do not adjust Yorkshire Water's costs for non-delivery. These adjustments are removed as the PR19 underperformance payments manage the risks of double funding.

In response to Yorkshire Water's representation on the 268ML/d start point, we fund the leakage reduction used to set the PR24 performance commitment levels. Reduction to a level of 260ML/d in 2024–25 has been previously funded by customers in PR19 allowances. We therefore do not align funding to the volume of 38.4 ML/d within its representations (with a company proposed start point of 268ML/d and an end of point of 229.6ML/d). We align funding for reduction with the PR24 performance commitment level, which is 36.2ML/d reduction. This is consistent with the company reporting 2025 leakage in CW5.35, and consistent with what the company confirmed in its leakage activity query response (where the company confirmed a reduction of 36.2 ML/d that included 7.7 ML/d of CSPL). We therefore allow funding for 36.2ML/d reduction, with a start and end point 260 ML/d and 223.8 ML/d.

We have amended our approach to funding leakage reductions for Dŵr Cymru. Rather than accepting the full reduction through enhancement we have changed our approach and requested that Dŵr Cymru should deliver some reduction through base. This reflects its current issues with leakage reporting and its poor leakage performance compared to other water companies.

Reallocations of costs

We continue to consider that leakage reduction costs for CSPL should be reallocated to smart metering. Many companies included CSPL costs in metering costs in business plans. We reallocated CSPL for the remaining companies in the draft determination.

Customer supply pipe leakage reduction will be proportional to the delivery of smart meters. As the CSPL costs are included in the metering costs, smart metering enhancement allowances will include a small allowance for identifying and addressing CSPL. The removal of lead supply pipes (which are funded as part of lead reduction) will also reduce CSPL and support companies to meet their leakage reduction targets. We do not make a leakage adjustment for lead pipe replacement activity.

In response to South West Water's concerns that they have not been funded for CSPL, at draft determinations we allowed funding of these costs through metering. In its representation data tables the company increased metering infrastructure costs to account for the CSPL costs. We therefore remove the leakage to metering reallocation made in draft determination

and accept the company's cost change in the metering model. We retain the draft determination approach to assess CSPL costs through the metering.

Leakage unit cost ('other activities')

The draft determination approach assumed that the leakage reduction in a particular year corresponded to expenditure in that year. However, the benefit from leakage reduction expenditure may not be seen until the following year. The draft determinations also examined leakage reductions in 2019–20 and 2021–22 to avoid including years where leakage increased despite leakage reduction spending. However, using only 2019–20 and 2021–22 data could skew unit costs as these years potentially include recovery from previous poor performing periods. The resulting unit rates may not therefore be reflective of long term leakage reduction costs.

To address these concerns, we have amended our approach for final determination by including the full 2018–19 to 2023–24 period to assess leakage reduction unit costs. We include data from 2018–19 and 2019–20 as it appears that companies were reducing leakage ahead of meeting the stretching leakage reduction targets in the 2020–25 period. There appears to be little leakage reduction activity in 2017–18 and so this year has been excluded.

In response to company and WRSE concerns, we tested the impact of meter penetration and leakage performance on the leakage reduction unit costs. While this did not identify a robust relationship, several companies with higher meter penetration rates, pressure management coverage and leakage performance levels had higher leakage reduction unit costs. Based on this, we identified an efficient unit rate for these companies using the historical unit costs from SES Water as indicative of the costs of a good performer. We applied this unit rate where companies¹²² performed well against these metrics.

For final determination we recognise the need to undertake a deep dive assessment for some bespoke leakage reduction activities. SES Water proposes additional leakage reduction costs from its District Meters Areas Asset Health (DMAAH) programme. The company does not provide compelling evidence why additional enhancement funding is required to undertake these types of activities. We expect a company to undertake this activity and associated investigations to understand the condition of the distribution network as part of normal capital maintenance, which funded through base expenditure allowances.

South East Water requests additional enhancement expenditure for network sensor costs to reduce leakage as part of its resilience programme. Many water companies are introducing smart networks through base expenditure allowances. South East Water does not provide evidence on the links between its smart network proposals and additional leakage reduction. We therefore do not provide additional enhancement allowances for this activity.

¹²² Anglian Water, Wessex Water, Bristol Water, South East Water, SES Water

Mains renewal

We continue to consider a single unit rate for mains renewal is appropriate. The unit rate is based on a wide range of data points and in terms of company leakage rates the one we use falls within this requested range. Given the range of costs presented by companies, then the unit rate is likely to covers a range of company factors and a mix of mains renewals and mains renewal plus communication pipe costs within them.

For Anglian Water we reviewed the evidence provided in their representations. It provided a benchmark of mains renewals work mix, and also provided the costs and quantities for communication pipes. It has not provided external benchmarks or cost curves. The company has not provided compelling evidence for a company specific uplift to the mains renewals allowance using the standard unit rate.

We reviewed the evidence provided in Southern Water's representations. It states the mains allowance does not account for communication pipes. The company has used a revised cost approach to determine a unit cost of £416 per metre for mains renewals, including communication pipes. The company has not provided a breakdown of the cost approach, there is no compelling evidence that the company requires an uplift to the mains renewals allowance and that we have not accounted for communication pipe costs.

We do not meet Yorkshire Water's request for assumed base funded mains renewal rate or unit rate per metre. We still consider the assumptions to be valid using the data and evidence that we have. We still expect Yorkshire Water to deliver its full leakage reduction that is funded and its performance commitment levels.

In response to WRE concerns about expected mains renewals through base our assumptions for mains renewal delivery, including what are funded through base are covered in section 2.2.1.

Our final determination

We expect leakage enhancement requests to reflect the reduction targets companies have set out within their latest 2024 water resources management plans (WRMP). For PR24 we are providing enhancement funding for all leakage reduction over 2025-30.¹²³

We continue to reallocate CSPL costs and not fund the benefits identified through that activity in leakage. We note that CSPL can make a large contribution to company leakage reduction plans.

Our efficient cost benchmark used to fund most companies, £1.41m per Ml/d, is similar to the median of the forecast unit costs for other leakage activities presented in business plans

¹²³ At PR19 we only provided enhancement funding for leakage for companies that were reducing leakage beyond the upper quartile performance level.

(£1.2 million per MI/d). It was lower than the indicative unit cost of £2.4 million per MI/d used for the upper quartile companies at PR19, although this rate included mains renewal activity which has higher costs. Based on the analysis of companies' performance we use a higher unit rate for five companies at £2.1 million per MI/d.

We fund mains renewal activities for leakage at a unit rate of £300 per metre, and for lengths that are required above those already funded through base and the asset health uplift.

Although at an industry level the reduction in leakage was set to be 13% over the 2025–30 period, it was hoped that these enhancement allowances (and other leakage funding areas) allow some companies to make more significant leakage reductions, similar in scale to the industry 16% reduction at PR19. For example, Thames Water at 21.9%, Severn Trent Water at 16.2% and South Staffs Water at 17.1%.

We make allowances of £723 million in the final determination an increase from the £547 million at draft determination.

3.6.5 Metering

What we said in our draft determinations

At PR19 we funded the delivery of just over 2 million meters over the 2020–25 period. For PR24 draft determinations we proposed to allow companies £1.6 billion to deliver 10.3 million meters (2.6 million new smart meter installations and 7.7 million technological upgrades).

We used an econometric modelling approach to determine efficient metering enhancement costs. We used separate models for new meter installations and meter upgrades. We apportioned smart meter infrastructure costs across new installations and upgrades before inputting meter costs into benchmark models.

Stakeholders' representations

We received representations from 15 companies on our approach to assessing metering costs.

Model specification

Several stakeholders raised various concerns with the model specification:

- Northumbrian Water, United Utilities, Thames Water, Yorkshire Water, Affinity Water and South East Water said the model does not account for the variation in work mix, and proposed setting benchmarks for different job types.

- Thames Water and Affinity Water said the model should account for other factors such as population density and meter penetration. They also said the model should not give equal weighting to companies with no market engagement.
- Affinity Water, Portsmouth Water, Thames Water, MOSL and Wave said the model should account for cost differences between residential and non-household meters.
- United Utilities said Hafren Dyfrdwy and Severn Trent Water should be combined as a single observation because the costs have been derived from the same tendering process, and the current model is putting extra weight on Hafren Dyfrdwy and Severn Trent Water .

Smart meter infrastructure

During the consultation period, we asked companies if they agree with our decision to assess smart infrastructure costs within the meter installation and meter upgrades models. South West Water and Portsmouth Water disagreed with our approach to assessing smart meter infrastructure, and stated it was a simplistic assumption that will disadvantage less mature companies.

Cost allocation

Four companies had concerns over the allocation of costs to base:

- Anglian Water and South East Water had concerns over the allocation of costs to base.
- United Utilities and Affinity Water said the model does not account for boundary boxes, and there are cost allocation issues within the model.

Two companies had concerns over the allocation of customer supply pipe leakage costs (CSPL) to metering:

- Anglian Water and South West Water said that the costs were associated with leakage activities, and should be assessed within the leakage model.

Other representations

We received representations from six other stakeholders.

- WAVE, Everflow, Strategic Panel & Committees and Business Stream said a more joined up approach is required for the smart meter rollout to avoid regional differences. They said a market wide strategy is required, with consistent messaging to customers and greater clarity on the timelines of smart functionality.
- CCW supported the allowance for smart meter roll-out at draft determinations, but wanted to see more information from companies, including on how companies will provide them to households and businesses in areas most at risk of water scarcity and how smart-meters will impact innovative tariffs to change customer behaviour.

- Water Resources South East (WRSE) states that the new installations metering model should include meter penetration rates as a cost driver and a unit cost approach should be used for non-household meters.
- MOSL and Waterwise had concerns companies had insufficient funding to deliver the business plan.
- Angling Trust had concerns that draft determination funding is insufficient to deliver the water resources management plan.

Our assessment and reasons

Model specification. We have retested meter penetration and population density in the models. Population density is statistically significant with new meter installations, but not statistically significant with meter upgrades. We incorporate the population density variable into the new meters model. Meter penetration is not statistically significant, and so we do not incorporate this variable into the models.

Use of work mix data. During draft determinations, we collected work mix data through the query process. We requested the work mix data to check cost categories were consistently apportioned across base and enhancement lines. We found that cost categories were not allocated consistently for meter upgrades and were consistent for new meters. In representations, some companies said work mix data should be used to account for the work mix variation in the new meters model. For new installations, we do not use any endogenous data such as work mix data, only exogenous data. This is consistent with our approach to econometric assessment not to include factors under management control as cost drivers. We have tested the work mix data and found that population density accounts for some variation in work mix. We do not consider that we should make additional adjustments for work mix.

Cost estimates for non-household meters. We have considered the feedback from both water companies and non-water companies on the cost differences between household and non-household meters. We have tested the impact of non-household inclusion and found this was not statistically significant (further details on this can be found in the enhancement modelling appendix). Affinity Water has presented a case study of two metering programmes which shows that more expensive programme has a higher proportion of non-household meters. Portsmouth Water tested the non-household split and found that non-household costs cannot be captured satisfactorily in the model. Portsmouth Water said that non-household meters should be assessed through a bottom-up approach using market tenders' and data collected through the work mix query. As stated, we have tested population density and found this accounts for some variation in meter costs. Thames Water provided a breakdown of unit rates (based on a large sample of meters), which shows their non-household costs are more expensive. We retain the same approach to assessing Thames Water's bulk meters through a deep dive, which funds an uplifted rate for bulk meters. United Utilities, Wessex Water, South West Water, South East Water, Southern Water and Yorkshire Water said there is a cost difference between household and non-household meters but have

not provided sufficient or convincing evidence to support this. We note that South Staffs Water, who are delivering only non-household meters through enhancement expenditure, have not commented on the aggregated cost estimate for household and non-household meters.

Cost allocation. Some companies raised concerns over our allocation of some costs to base expenditure. We retain the draft determination approach to base allocations for meter upgrades, using the work mix query data. This provides greater consistency of cost data across base and enhancement expenditure for meter upgrades. In representations some companies reallocated some of their meter upgrade enhancement costs to base. Where companies reduce their meter upgrades enhancement request, we reduce the allocation accordingly but retain the same approach from draft determinations. We reallocate a reduced total of £111 million from meter upgrades to base, compared to £186 million at draft determinations. Further details of the base allocations can be found in the enhancement modelling appendix.

Robustness of company cost estimates. Some companies raised concerns that Ofwat was using potentially inaccurate or untendered cost estimations from some companies. At final determinations, where companies have provided sufficient and convincing evidence for market engagement, we accept cost revisions in representation tables. Most companies confirm and evidence that they have carried out further market engagement. For final determinations we do not weight individual company forecast inputs, and we consider the model captures and accounts for market tested costs.

Historical costs. Some companies raised concerns that the metering models were based on forecast costs and did not include historical costs. We have crossed checked forecast costs against historical costs and the PR24 unit rate allowances are above outturn unit rate allowances for 2023-24 for new AMI meters, in 2022-23 prices.

Smart meter infrastructure. Most companies accepted the approach, subject to the model used. Companies stated infrastructural costs are driven by population density, geography, use of whole life costs and differing financial models ("data as-a-service" or upfront capex). We have considered the push back from South West Water and Portsmouth Water, and assessed the evidence provided by the two companies. South West Water requested that the full infrastructural costs are assessed outside of the modelled process but have not submitted sufficient or convincing evidence to support this approach. Portsmouth Water have requested part of their infrastructural costs are assessed outside of the modelled process and have provided sufficient evidence for a partial uplift to infrastructural cost. Further details on the adjustments for smart infrastructure can be found in the modelling appendix.

Allocation of costs to leakage. In draft determinations we funded customer supply pipe leakage benefits through metering enhancement, these costs will be proportionally affected by smart meter quantities and several companies already include these costs through

metering. We want to make sure that our assessment is based on costs that are like for like. We have assessed the push back provided by Anglian Water and South West Water in representations. These companies have not provided sufficient or convincing evidence that customer supply pipe leakage costs should not be funded through the metering model approach. We have therefore retained our approach to allocating of customer supply pipe leakage costs to metering. South West Water and SES Water have confirmed that representations tables now have customer supply pipe leakage costs already allocated to metering. We have assessed the cost changes for these companies and drop the leakage allocation to prevent double counting their customer supply pipe leakage costs. We have retained the allocation for Anglian Water and Dŵr Cymru.

Alignment with the WRMP. We have considered the feedback from Angling Trust, regarding concerns that funding at draft determinations was insufficient to deliver the water resources management plan (WRMP). We sought to fund at least the meter numbers identified in the WRMP. Where meter numbers were materially lower, we checked whether companies have legitimately excluded new build meter connections in their business plans (which existing customers should not fund). Yorkshire Water has reduced its household meter quantities to levels materially lower than the WRMP, we make an adjustment to align the quantities with the WRMP. For all other companies, we do not make a WRMP driven adjustment. In some cases, we are allowing customer funding for more meters than in the WRMP. We consider that our final determination allowances are sufficient for companies to deliver their WRMP metering ambition and related leakage and PCC targets.

Our final determination

Our final determination allowances are based on a combination of new smart meter costs and smart meter upgrades. We continue to exclude Portsmouth Water from the models due to unreliability in forecast data. This is unchanged from draft determinations. We adjust the quantity of meters funded for Yorkshire Water, to align with the quantity proposed in the WRMP. We accept a 93,000 increase in meter quantities from Thames Water, to install new meters in the Thames Valley region. We retain our approach to the adjustment for Dŵr Cymru, which funds automated meter reading technology (AMR), compared to the rest of the sector which is funded for advanced monitoring infrastructure technology (AMI). Further details of the metering enhancement model can be found in the enhancement modelling appendix.

In total we allow £1.7 billion of enhancement for delivery of 10.4 million smart meters at final determinations. This is split into £1.1 billion to fund 2.8 million new meters and £624 million to fund 7.7 million meter upgrades. Further detail on the modelling approach and allowances can be found in the enhancement modelling appendix.

This enhancement allowance is in addition to the adjustment of £729 million to the wholesale water base expenditure allowances. This adjustment, described in section 2.2.2, will enable

the sector to deliver the base activities related to the programme of meter upgrades planned over the 2025–30 period.

3.6.6 Water efficiency

Demand-side improvements are activities to reduce customer demand usually through water efficiency activities. These activities support companies to achieve their long-term per capita consumption (PCC) targets. The need for this investment is justified by the scale of demand savings in the WRMPs. As such we expected the scale of reductions and options to be proposed in the business plan and draft determination representations to align with the latest WRMP.

Investment on water efficiency typically covers customer-side options to reduce water consumption and wastage within household and non-household properties. For this enhancement assessment we exclude costs and benefits identified for leakage and metering activities as they are funded elsewhere. It also excludes demand saving benefits delivered through Government-led interventions, such as water labelling schemes which are likely to be in place during the 2025–30 period¹²⁴. We do not expect customers to pay for these savings as these are not being delivered by water companies.

What we said in our draft determinations

We validated companies' proposed costs and benefits for each option against the corresponding companies' latest WRMP data and queried any areas of variance.

We calculated unit costs for megalitres per day (Ml/d) of cumulative water saved volume by 2029–30 for each company. From our analysis, the unit costs per company ranged from £0.3 million to £8.3 million per Ml/d. The median value was £1.2 million per Ml/d which we applied to the projected cumulative benefits of the company-led options.

For companies with high unit costs (Southern Water, Yorkshire Water and South East Water) we carried out deep dive assessments applying our model adjustment enhancement criteria. However, there was not compelling evidence to allow higher costs for these companies as the types of activities being proposed were determined to be common across all companies. We therefore applied the median unit cost of £1.16 million per Ml/d across all companies.

Stakeholders' representations

Southern Water, Yorkshire Water, South East Water and South Staffs Water disagreed with Ofwat's approach to assessing water efficiency allowances. They state that the approach based on a simple mean unit-rate benchmark, fails to account for company-specific

¹²⁴ [Household goods to carry water efficiency labels - GOV.UK](#)

circumstances, long-term benefits, and innovative programmes. Instead, they advocated for a more tailored approach that considers individual company performance, specific circumstances, and the long-term benefits of water efficiency initiatives.

Waterwise expressed disappointment that, based on analysis by WaterUK, the draft determination represented a 29% reduction from what was in the business plans despite the scale of the water availability challenge we face. Strategic Panel & Committees and Wildlife and Countryside Link had concerns that funding for water efficiency was not aligned with the WRMP. They stated Ofwat must clarify how we determined the allowance is sufficient for companies to deliver their WRMP, metering ambition, and related leakage and per capita consumption (PCC) targets.

Our assessment and reasons.

Water companies have proposed a range of water efficiency activities with varying levels of savings. Our PR24 draft determination allowed unit costs were a significant uplift on £0.5 million per Ml/d outturn unit costs for demand-side improvements set out in annual performance reports (APRs). There has also been significant underspending of PR19 2020-24 water efficiency enhancement allowances for some companies.

For the final determination, we updated our unit cost benchmark for water efficiency activities to £1.17 million per Ml/d based on the updated company forecasts. A single unit rate is appropriate given the range of activities that companies propose are still relatively stable, have been undertaken in previous periods, and generally companies undertake several of these activities within its programme (rather than one single intervention type). We still consider this unit rate appropriate to apply across the industry as its significantly higher than outturn delivery costs and as a median unit rate does not apply a significant challenge to most companies. This unit rate, that is based on forecast median unit costs and significantly higher than PR19 outturn, should be sufficient for companies to deliver demand savings as found in their latest WRMPs.

We tested additional and alternative cost drivers for water efficiency. This included meter penetration and leakage performance. We found that these variables did not improve the explanation of company forecast costs better than the simple unit cost being used (£ per Ml/d benefit).

However, we identify that five companies are significant outliers when comparing to the standard unit rate we apply to stated benefits. This addresses the representation concerns over large cost differences for some companies and that we need to look at specific reasons for high costs.

For final determination we deep dive these five companies with significantly higher costs than our cost benchmark, Dŵr Cymru, Southern Water, Yorkshire Water, South East Water

and South Staffs Water. In the model adjustment deep dives, we consider evidence that there is company specific justification that the allowances need to be higher than the benchmark.

As with all the water efficiency enhancement claims we accept the need for investment based on the volumetric savings presented as aligned with the latest WRMP. In the deep dives we took account of evidence and likely factors explaining high unit costs including high outturn costs during 2020–25, continuation of PR19 schemes (at a similar unit rate), high meter penetration and if a company was focussing on high unit cost activities with the water efficiency option range. All companies did not provide compelling evidence that they required the full unit cost as requested. However, through the assessment we identified and allowed higher unit costs for these five companies than the standard £1.17m per Ml/d.

The resulting unit rates calculated in the deep dives range from £1.8 million to £2.4 million per million litres per day (Ml/d). Dwr Cymru receives the highest unit rate for the continuation of its Project Cartref scheme, and Southern Water receives the second-highest for the continuation of its Target 100 scheme. For Project Cartref we allow the outturn unit cost with a 10% cost efficiency challenge to represent the likely efficiencies as the project matures. Both companies are continuing water efficiency programmes, which commenced and have high outturn costs this period, and which will deliver further benefits over the next five years.

Our final determination

For final determination, we allow £260 million for demand saving enhancements, which is a cost challenge of 11% but an increased allowance from the draft determination of £226 million. We are providing a unit rate ranging between £1.17 per Ml/d which applies for most companies, up to £2.40 per Ml/d for Dwr Cymru for the continuation of its Project Cartref scheme.

We are also introducing the Water Efficiency Fund with additional funding of up to £100 million made available for 2025–30, which will facilitate the development of transformative improvements to water efficiency across England and Wales to help reduce water demand.¹²⁵ Our allowances represent a significant step change in water efficiency funding. We expect companies to deliver improved service as a result.

3.7 Drinking water quality improvements

Drinking water quality improvements cover enhancement related activities to maintain and improve drinking water quality provided to customers. Companies identify the proposed investment which were reviewed by the Drinking Water Inspectorate (DWI). The DWI can

¹²⁵ [Water efficiency fund - Ofwat](#)

serve legal instruments, such as notices, undertakings or accept acknowledged actions to track the activities identified by companies.

3.7.1 Raw Water Deterioration and Taste, Odour and Colour

Raw water deterioration (RWD) expenditure 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 seeks to address customer acceptability of drinking water, specifically taste, odour and colour issues (such as iron, manganese, geosmin, etc.).

What we said in our draft determinations

For RWD, although companies propose a range of schemes there are common activities across several companies, which allowed opportunities for some areas to be unit cost benchmarked. We used scheme level data to develop benchmarking models for disinfection treatment (using ultraviolet irradiation, UV) and nitrate treatment (using ion exchange). Models included a fixed cost and an incremental cost per Ml/d of treatment, reflecting water quality and engineering understanding. The models worked well for lower cost and smaller scale schemes (<£10 million) where there are more data points and where there are likely to be less complex and/or bespoke installations.

We had less data points for the larger cost schemes (>£10 million) meaning the benchmark was less reliable. Some schemes included expenditure on assets in addition to ultraviolet treatment and ion exchange treatment, which were not captured in the model. We deep dived scheme costs where a company's scheme was an outlier based on model predictions or where the scheme was beyond the scale that the model could reasonably predict for.

Benchmarking for other water quality parameters and treatment solutions was not sufficiently robust to set cost allowances. We deep or shallow dived the remaining requests depending on materiality. We assessed the need for enhancement as part of the deep dive and accepted a DWI legal instrument (notice or undertaking) and acknowledged action as evidence that the investment is required. We challenged costs where there is overlap with base or previously funded activities and where the company failed to provide evidence that base implicit allowance had been taken account of. We considered the evidence provided for the best option for customers and cost efficiency, and challenged where the evidence provided was not sufficient and convincing.

TOC expenditure included investment in both water treatment and distribution systems (service reservoirs and water mains). We used a combination of modelled, deep and shallow dives to make allowances.

Stakeholders' representations

The DWI noted in its representation to the draft determinations that it worked well with Ofwat having an aligned approach to water quality schemes. The DWI noted that some schemes were submitted to Ofwat without the DWI's prior knowledge and suggested that unassessed schemes are highlighted, retrospectively assessed and tracked as 'acknowledged actions' by the DWI and Ofwat. The DWI noted that PFAS represents a complex and multifaceted challenge for companies and regulators.

For **raw water deterioration**, Anglian Water, Severn Trent Water, South West Water, United Utilities, Wessex Water, Yorkshire Water and Portsmouth Water challenged our approach in their representations.

Anglian Water, Severn Trent Water and Southern Water stated that their external benchmarking identifies their schemes as efficient. Anglian Water also stated that using a single cost driver, in this instance treated flow (for nitrate solutions), is inappropriate as this alone does not explain efficient costs. Affinity Water supported our unit cost modelled allowances and uplifted its proposed costs to match our allowances. Southern Water reviewed its costs and applied a 5% efficiency challenge to all their schemes.

All companies, except SES Water, Dŵr Cymru and South Staffs Water, raised concerns about the level of challenge to schemes that were subject to deep dive assessments. Companies argued that the scale of the cost challenge could impact their ability to meet their statutory obligations as the schemes are linked to DWI legal instruments.

Anglian Water, Affinity Water, Severn Trent Water, United Utilities and South East Water submitted additional expenditure requests for PFAS treatment schemes or PFAS strategy (for example, investigation, sampling) and nitrate treatment.

For **taste odour and colour**, Anglian Water, Dŵr Cymru, South West Water (South West and Bristol regions), United Utilities and Yorkshire Water provided representations.

Anglian Water states it appreciates the need for a shallow dive efficiency challenge, resubmits its original costs as it considers these to be efficient.

Dŵr Cymru, South West Water (South West and Bristol regions), United Utilities and Yorkshire Water provide scheme specific representations. Dŵr Cymru provides evidence why the £/metre mains renewal is higher than our calculated average and Cost Benefit Analysis in response to our draft determination.

United Utilities stated that there were no alternative solutions for its aqueduct scheme stating to the continuation of the for the final phase of the works. The company stated the final phase of the scheme is more expensive as work was in increasingly urbanised locations and there were complex interactions with other infrastructure.

Yorkshire Water stated that the cost challenges on its water treatment works and trunk main conditioning scheme to achieve taste and odour targets would not allow the schemes to be delivered.

PFAS Uncertainty Mechanism

The DWI request that we consider a novel financial solution that is sufficiently flexible to account for multiple uncertainties, protects consumers and facilitates companies to plan and invest to manage PFAS risks.

Most companies (excluding Dŵr Cymru, Hafren Dyfrdwy, United Utilities, SES Water, South West Water) recommend including a 'PFAS Uncertainty Mechanism' to allow for the additional costs of PFAS compliance in the 2025-30 period. Anglian Water, Severn Trent Water and Affinity Water provided the strongest representations reflecting the greatest perceived PFAS risks in their areas. Ten companies supported the 'PFAS Uncertainty at PR24' document co-ordinated by Water UK.

Companies stated the following risks could arise in-period:

- Increased sites failing regulations (Anglian Water, Northumbrian Water, Severn Trent Water and Wessex Water);
- Increasing regulations post-final determination (Anglian Water, Northumbrian Water, Severn Trent Water, Yorkshire Water, Thames Water and Wessex Water);
- More PFAS compounds could be included in the cumulative regulation concentration (Anglian Water, Severn Trent Water and Wessex Water);
- New PFAS compounds identified lack evidence on appropriate treatment (Anglian Water);
- Unfunded additional in-period costs (eg laboratory, waste disposal, construction) (Southern Water); and
- Potential changes in raw water quality due to third parties (Wessex Water).

Northumbrian Water and Anglian Water argue that there is a risk of poor financeability and financial resilience without additional in-period funding from a PFAS uncertainty mechanism.

While Thames Water does not submit an enhancement expenditure request for PFAS, it states that significant investment could be required later in the period which would need to be captured by an uncertainty mechanism.

Anglian Water lists the advantages of a PFAS uncertainty mechanism as it would: allow drinking water PFAS risks to be reduced quickly, allow companies to be remunerated in period, reduce risks to company financeability and financial resilience, and incentivise companies to treat PFAS efficiently. Anglian Water recommends that the mechanism is based on a fixed unit cost for PFAS treatment (£/Ml/d) with end-of-period 'True-Up'.

Our assessment and reasons

Companies provided additional data and evidence in response to our draft determination. This additional information has allowed us to reassess cost challenges, include additional DWI supported schemes and allow higher cost allowances for final determination.

For unit cost models, we maintain our approach from the draft determinations and calculate unit cost modelled allowances for ultraviolet treatment and ion exchange treatment use for RWD and TOC. Companies have updated the costs for twenty-four schemes and South East Water included one new scheme for nitrate ion exchange treatment. The models work well for lower cost and smaller scale schemes (of less than £10 million) where there are more data points and where there are likely to be less complex and/or bespoke installations. We continue to consider that our modelled approach has advantages over company (Anglian Water and Severn Trent) own benchmarking in terms of independence and benefits from a relatively large sample size. Anglian Water suggest that using a single cost driver was inappropriate. We consider that we have included the key driver of costs, and the range of data points for each company and included in our model provides an appropriate average allowance for each company.

We have reassessed company scheme specific deep dives for RWD and TOC following the additional evidence and updated costs submitted by companies in their representations. This has resulted in increased expenditure allowances. Remaining deep dive cost challenges are a result of insufficient and convincing evidence (on base overlap, benchmarking, third-party cost assurance) to justify that the costs companies have submitted are efficient and are required.

We have reduced the company specific shallow dive efficiencies applied in RWD and TOC following our updated approach set out in section 3.2.

For TOC there is a small reduction in requested expenditure from £391 million to £385 million. This reflects efficiencies identified by South West Water for their South West and Bristol regions, and Yorkshire Water. We received no new schemes at representation. All companies provide improved evidence to our cost challenges. We continue to use a combination of modelled, deep and shallow dives to make allowances.

PFAS uncertainty mechanism

We have considered how to protect customers interests and enable appropriate investigations, and scheme design and delivery within the 2025–30 period to manage risks from PFAS. We discussed potential options with the DWI.

Considering the latest DWI guidance, we have decided to include allowances for PFAS scheme costs in the final determination if:

1. The scheme has a site-specific notice issued by DWI for PFAS; or
2. The scheme pertains specifically to investigation or design costs for PFAS schemes for delivery within the 2025–30 period.

For PFAS schemes that meet our criteria for the final determination we allow a total of £353 million for schemes to be delivered during the 2025–30 period. This is divided into £330 million for deep dived schemes and £23 million for shallow dived schemes for Anglian Water, United Utilities, Southern Water, Severn Trent Water, Wessex Water Affinity Water, Portsmouth Water and South East Water. We do not challenge the efficiency of company proposals as company proposed costs appear efficient against external benchmarks.

Where schemes remain uncertain and do not meet the criteria, we are including a PFAS uncertainty mechanism. As the costs and potential solutions are uncertain, we include a notified item in our final determinations and intend to examine costs in-period via a reopener. This will allow companies to claim for any material increase in capital expenditure (to carry out works at treatment works), beyond those costs and work that Ofwat allowed when making the final determination, if following the completion of investigations, companies need to deliver schemes in the 2025–30 period required by a new DWI notice given on after 20 December 2024. The uncertainty mechanism will allow companies to obtain additional revenue if additional expenditure requirements are material. If costs are significant but not material, then they will be recovered at the end of the period reconciliation. By significant we consider the costs would need to exceed the shallow dive threshold of 0.5% of relevant wholesale totex or £10 million. If companies consider a relevant change has occurred and would like to recover additional expenditure allowances then we expect that they will need to submit an additional expenditure request together with details of how this meets the requirements of the uncertainty mechanism in March 2026 or March 2027. We expect any changes to requirements after this date to be reflected in PR29. Further detail of the proposed uncertainty mechanism is set out in 'PR24 Final Determinations: In-period adjustment'. This approach will cover the seven PFAS related schemes that do not meet our criteria, totalling £210 million for Severn Trent Water, Affinity Water, Portsmouth Water and South East Water.

Our final determination

In total we allow £2.0bn for raw water deterioration and taste, odour colour, including contingent allowances. This is an increase of £0.7bn compared to the draft determinations.

This reflects an increase in requests of £0.4bn, improved evidence put forward by companies and the contingent funding for uncertain PFAS schemes. This compares to company requests of £2.1bn.

Contingent allowances are made up of £210 million for PFAS and £168 million for Thames Water UV programme that will be part of the large scheme gated process.

We propose to continue to include a PCD's for customer protection for RWD and TOC proposals attached to the DWI legal instruments and acknowledged actions.

Table 27: Summary of allowances for raw water deterioration and taste, odour colour

Company	Raw water deterioration (£m)	Taste odour colour (£m)	Contingent allowances (£m)	Total allowance (£m)
Anglian Water	213.48	3.76		217.24
Dŵr Cymru	55.38	99.43		154.81
Hafren Dyfrdwy	-	-		-
Northumbrian Water	8.05	-		8.05
Severn Trent Water	341.58	-	102.60	444.18
South West Water	47.18	22.23		69.40
Southern Water	86.66	-		86.66
Thames Water	10.75	-	168.37	179.12
United Utilities	90.52	138.64		229.16
Wessex Water	37.80	-		37.80
Yorkshire Water	39.12	29.22		68.34
Affinity Water	149.71	-	95.52	245.23
Bristol Water	53.36	17.57		70.93
Portsmouth Water	29.09	-	8.66	37.75
South East Water	61.44	-	3.44	64.88
South Staffs Water	31.36	-		31.36
SES Water	8.50	-		8.50
Total	1,263.97	310.86	378.60	1,953.42

3.7.2 Lead

The UK Government SPS¹²⁶ for Ofwat states that “safe, clean drinking water is vital for public health and the wellbeing of our society. The Government supports action by the industry to trial approaches to reducing exposure of lead to customers from drinking water, from a public health perspective”.

¹²⁶ Defra, February 2022: The government's strategic priorities for Ofwat

The lead standard in drinking water is 10 ug/l in England and Wales, although the Welsh Government ambition is to achieve levels as low as reasonably practicable, which is considered to be 5 ug/l¹²⁷. The DWI's normal point of compliance measurement for these standards¹²⁸ is the customer's kitchen tap.

In the DWI's Long-term planning guidance for the quality of drinking water supplies¹²⁹ the expectation is for all companies to strategically plan for the future by taking suitable approaches towards reducing lead levels in the upcoming 2025–2030 period and successive periods. By developing and gaining experience through implementation companies should aspire to achieving positive reductions of lead in drinking water.

Reducing exposure to lead in drinking water can be achieved by either removing lead from the system through pipe replacements (or relining) or treating water with orthophosphate to reduce plumbosolvency (lead leaching). When companies replace a lead communication pipe it only meets the enhancement need in this area if it is for water quality (ie lead reduction) purposes, despite other benefits, such as leakage or addressing pressure issues. As part of the trials as referenced in the UK Government SPS some companies propose lead supply pipe (either external only or external and internal) replacements to remove lead piping before the compliance point at targeted properties (ie customers and/or schools/nurseries). As well as the direct health benefits of lead pipe removals there can be customer benefits from companies being able to reduce or completely remove phosphorus dosing of drinking water to reduce lead concentrations.

What we said in our draft determinations

In our PR24 draft determinations we assessed expenditure for lead communication pipe replacements separately from lead supply pipe replacements. For lead communication pipe replacements we assessed costs by triangulating between a panel data model and the industry median unit cost.

For lead supply pipe replacements, we assessed costs using a median unit cost benchmark. We used a median unit cost of £2,073 per replacement for external supply pipes and £711 per replacement for internal supply pipes. This was consistent with our cost benchmarking approach applied in PR19, the Green Economic Recovery¹³⁰ and the accelerated infrastructure delivery project.

We deep dived South East Water's lead pipe surveys expenditure. South East Water requested a significant amount of enhancement for lead pipe surveys and orthophosphate

¹²⁷ The revised [EU drinking water directive](#) has reduced the limit from 10 to 5 ug/l.

¹²⁸ DWI, The Water Supply (Water Quality) Regulations 2016 for England and The Water Supply (Water Quality) Regulations 2018 for Wales

¹²⁹ DWI, Long term planning guidance for drinking water quality, September 2022

¹³⁰ Ofwat, [Green economic recovery: Final decisions](#), July 2021

disengagement trials. We made an allowance for the two orthophosphate dosing disengagement trials but not for the extensive surveys that were proposed.

Stakeholders' representations

Four companies¹³¹ disagreed with our cost assessment approach. Three companies¹³² argued that our proposed approach does not provide sufficient allowances for replacing lead pipes in schools as it assumes the same replacement costs for schools and household properties. The companies stated that replacements in schools are more expensive due to greater complexity and pipe length compared to replacements in households.

Anglian Water disagreed with our approach to assessing lead communications pipe replacements. It stated that we should not use a panel data model as unit costs do not change over time so there is little value that a panel data model can add. Instead it suggested that we should use a simple cross-section model.

South East Water raised concerns that we rejected the requested allowances to conduct a survey of all company and service pipes and the location of lead pipes in the 2025–30 period. The company states it has a legal obligation within the DWI undertaking SEW-2023-00016 measure d) to conduct a survey of all company and service pipes to determine composition and location of lead pipe in AMP8.

Our assessment and reasons

We want to facilitate the replacement of lead pipes in schools. This is where we expect the benefits from lead reduction to be greatest as children are most vulnerable to the effects of lead.

We recognise that replacing lead pipes in schools could be more expensive due to longer length of supply pipes and the additional disruption that closing access to schools may cause compared to other properties. We acknowledge that providing companies with an average unit cost allowance may not provide sufficient funding to those companies planning to do more replacements in schools. This could risk delaying the public health benefit of removing lead pipes in schools. Therefore, for final determinations we assess replacements in schools separate from other property types. We do this for lead supply pipes but not for lead communication pipes where we expect length of pipe to be similar across all property types.¹³³

¹³¹ Anglian Water, Hafren Dyfrdwy, Portsmouth Water, SES Water.

¹³² Hafren Dyfrdwy, Portsmouth Water, SES Water.

¹³³ Communication pipes connect the boundary box in each property to the mains network. The length of these pipes tends to be standard across the network as it covers the length between the boundary box at the edge of the property and the road under which the mains pipes run.

For the replacement of lead supply pipes (internal and external) in properties other than schools, we continue to use a median unit cost benchmark to assess costs. We have updated our analysis to: i) reflect the latest cost data submitted by companies since draft determinations; and ii) remove the costs and volumes associated with supply pipe replacements in schools.

For replacement of supply pipes in schools we take a different approach to assessing costs for internal supply pipes and external supply pipes.

For internal supply pipes in schools, we set allowances using the companies' requested expenditure. Only five companies¹³⁴ requested allowances for replacement of internal supply pipes in schools. This provides too few data points to develop robust benchmarking. There is wide variation in unit costs across the five companies. Given that the requested costs are not material enough and there is uncertainty around the length of internal supply pipes in schools¹³⁵ we accept the companies' requested expenditure.

For external supply pipes in schools, we use a median unit cost benchmark to assess costs. Nine companies¹³⁶ requested allowances to replace external supply pipes in schools. Due to the large variation in length of pipe assumed by different companies we calculate the median unit cost based on length of pipe rather than number of pipes. This is different to our approach for other property types given that the variation in length of pipe is significantly larger for schools than for other properties.

In response to Anglian Water's concern on the use of panel data model to assess lead communication pipe replacement costs, we continue to consider that variation in unit costs over time do provide useful insights to our analysis but recognise that some of these variations may be driven by data issues. We are now using a pooled ordinary least squares (OLS) approach rather than a random effects approach to assess costs. The former approach places less weight on variation across time than random effects does. We set out further details on our reasoning for this change in our approach in section 10 of 'PR24 final determinations: Expenditure allowance: Enhancement cost modelling appendix'.

South East Water's lead survey work

Following the company response, we re-assess the company requests to allow costs of £17.4 million for lead survey work of certain elements (stop tap surveys, trial holes and oncosts). We still consider these elements will not drive a step change in the current level of service to a new base level, do not present best value for customers and go beyond the expectations of

¹³⁴ Anglian Water, Hafren Dyfrdwy, Northumbrian Water, Portsmouth Water and Southern Water.

¹³⁵ South West Water, Portsmouth Water, Wessex Water, Anglian Water and Hafren Dyfrdwy expressed concern for the uncertainty in the lead replacement programme for schools. This is because the companies have carried out pre-emptive assessments that represent an approximation of the work due to be delivered in the 2025-30 period, so the location, length and cost of replacing lead pipes in schools may be subject to change.

¹³⁶ Anglian Water, Hafren Dyfrdwy, Northumbrian Water, Wessex Water, Yorkshire Water, Portsmouth Water, South Staffs Water, SES Water and Southern Water.

the government's strategic priorities for Ofwat¹³⁷. The government's strategic priority for Ofwat in this area is to trial approaches to reducing exposure of lead to customers from drinking water, from a public health perspective. We therefore do not allow additional funding for this work.

We shall allow and allow costs of £1.8 million for lead survey work of certain elements (water quality sampling for the presence of lead, oncosts and lead locator spatial assessment). We also shall allow and allow costs of £4.5 million for the phosphate disengagement trial and proportional oncosts. These elements are aligned with the DWI legal instrument for the company's lead strategy. We make total cost allowances of £6.3 million for South East Water.

We set out further details on our approach and how we address comments from stakeholder representations in 'PR24 final determinations: Expenditure allowances – Enhancement cost modelling appendix'.

Our final determination

For the final determination we assess lead reduction costs as follows:

- We triangulate between a panel data OLS model and median unit cost for communication pipes. The panel data model uses forecast data. We have assessed historical unit costs and these are broadly in line with forecast unit costs.
- We disaggregate our assessment of costs for lead supply pipe replacements. We are now providing higher allowances for companies which are planning to do replacements in schools.
- For properties other than schools we use a unit rate of £1,842 for external supply pipes and £704 for internal supply pipes.
- We apply a combination of deep dive and shallow dives to assess South East Water's lead survey related expenditure request. We set expenditure allowances of £6.3 million compared to the total expenditure request of £17.4 million.

Overall we allow £491m for lead compared to £391m in draft determinations. Most of the increase in allowance is driven by United Utilities, for which we are now setting an allowance for supply pipe replacements.

Table 28: Summary of allowed expenditure for lead reduction activities

Company	Final Determination allowed (£m)
Anglian Water	15.69
Dŵr Cymru	13.48
Hafren Dyfrdwy	4.34

¹³⁷ The government's strategic priorities for Ofwat, February 2022

Company	Final Determination allowed (£m)
Northumbrian Water	48.635
Severn Trent Water	40.89
South West Water	44.07
Southern Water	15.23
Thames Water	94.06
United Utilities	124.97
Wessex Water	15.42
Yorkshire Water	30.77
Affinity Water	7.22
Bristol Water	14.92
Portsmouth Water	2.20
South East Water	6.94
South Staffs Water	8.85
SES Water	3.57
Total	491.27

3.8 Resilience and security

3.8.1 Resilience

In the PR24 methodology we set out that resilience enhancement investment can be requested to manage increasing risks, or changing acceptance or acceptability of risk, from hazards that are beyond company control and not covered by other enhancement areas (for example, increasing risk of source water pollution, river or coastal flooding). We excluded funding to manage existing risk from all hazards and funding to address the failure of assets managed through maintenance, as these should be managed through base costs¹³⁸.

Requests for resilience enhancement investment should be set in the context of a long-term risk management plan, be supported by customers, be prioritised considering affordability, and meet seven key requirements set out in our PR24 methodology:

- be based on a clear and systematic risk assessment process that shows the investment is a priority;
- assessments should be data driven;
- risk assessments must address specific relevant hazards, and investments should be cost beneficial, and represent 'best value';
- optioneering must consider all types of mitigations including the so-called 4 Rs, resistance, reliability, redundancy, response and recovery;

¹³⁸ Ofwat, [PR24 final methodology: Appendix 9 Setting expenditure allowances](#), December 2022, pp51–56

- evidence must be provided of the consideration of partnership approaches to establish that the overall management of 'system of system' risk is efficient and financial contributions appropriately set;
- potential impacts on common performance commitments should be assessed and accounted for; and
- where investments mitigate multiple risks, the costs should be proportionally allocated to the appropriate cost category, including base maintenance.

Investment should be prioritised and promoted based on an understanding of the current level of risk, how this would change under the proposed investment and this compares to the risk appetite of customers and the company's board.

What we said in our draft determinations

Companies requested a significant amount of enhancement for resilience at PR24. This was £1.9 billion for water and £475 million for wastewater. However, even with such large requests, companies found it difficult to quantify the current level of risk, how much risk is increasing, and set out how this would change under their proposed investment. This included difficulty evidencing any increasing risks from climate change and how those risks impacted the performance of company systems and assets.

Companies also found it difficult to demonstrate clear separation from base maintenance activities, such as managing existing risk, or proposed investment to address risks associated with failure of assets managed through maintenance. Allowing more enhancement where this is the case increases the likelihood of customers paying twice for a level of service that they should already be receiving.

Even with these challenges we allowed for over £1.2 billion in water and £165 million in wastewater. Most of the allowed funding in wastewater was for climate change.

These allowances are much greater than in PR19 final determinations where £670 million was allowed for water resilience. Although most resilience investment was bespoke, we grouped our assessment into the following areas: resilience interconnectors, smart networks, single source of supply, water production and supply resilience, and power and flood resilience.

Resilience interconnectors

These represent an area with material enhancement cost within resilience and security investment requests. This is where companies identify additional interconnectivity in water supply networks as a solution to resilience risks (separate to the WAFU supply benefit of supply interconnectors). We assess these separately to other resilience claims whilst still applying the enhancement assessment criteria through the deep dive approach.

In addition to the evidence-based assessment of the deep dive, we tested cost efficiency by applying the costs, pipeline lengths and capacity to our supply interconnector model. Where the model indicates that based on length and capacity the cost of the interconnector is efficient, we do not challenge cost efficiency in the deep dive.

At draft determination, we allowed investment in interconnectivity acknowledging the resilience benefits that can be achieved by having more flexibility and to move larger quantities of water through company networks to meet a range of hazards.

Smart networks

Companies identified benefits to this investment as being reduced mains bursts and improved pressure management and leakage. We assessed investments in the category of smart networks using deep dives to assess the suitability of the proposal for enhancement investment. We expected the maintenance and replacement of assets and systems used in the production and supply of water to modern equivalent standards to be delivered through base allowances. The proposed schemes failed to provide sufficient and convincing evidence to demonstrate their eligibility for enhancement allowances through a step change to a new, improved level of service; nor to demonstrate that the proposed investment went beyond what we would reasonably expect a company to be doing already.

Single source of supply

Companies made resilience enhancement requests for addressing what they considered single points of failure. Companies identified a range of interventions to address these risks including tank upgrades, new sources, new water mains and dualling critical mains. We used deep dives to assess the suitability of the proposed investment for enhancement funding. We expect the maintenance and replacement of assets and systems used in the production and supply of water to modern equivalent standards to be delivered through base allowances.

Water production and supply resilience

Companies requested additional allowances to improve water production and supply resilience. For example, new water treatment works, increased capacity or treatment capability at current water treatment works and additional treated storage. Companies stated benefits to mitigate climate change risks, hot weather demand peaks and even address water quality issues (where there isn't a DWI legal instrument in place already requiring this). Although there was a poor quantification of risks, and lack of evidence that base overlap has been accounted for, we made some allowances for these schemes at draft determination and challenged companies to provide more evidence.

Power and flood resilience

Companies requested enhancement funding across water and wastewater for power and flood resilience (river, rainfall and coastal). Most companies were unable to adequately justify their investment cases for flood and power resilience, particularly in relation to increasing climatic risks. Therefore, we made no specific enhancement allowance for flooding or power resilience expenditure. See section 3.8.2 climate change resilience uplift for more details.

Stakeholders' representations

Resilience interconnectors

SES Water and South Staffs Water accepted our draft determination, but six companies¹³⁹ indicated that the proposed allowance would not be sufficient to deliver resilience benefits and address the risks. These six companies provided additional evidence. No company submitted new schemes for resilience interconnectors to be funded.

We also receive representations from the Water Resources South East (WRSE) regional group highlighted the importance of sub-water resource zone interconnectors which help to facilitate the water resources management plan (WRMP) at a regional level.

Water production and supply resilience

Dŵr Cymru and South East Water provided new evidence against our deep dive assessment comments. Additionally, in response to our draft determination, South East Water revised the investment to reallocate £2.5 million of enhancement expenditure to base expenditure relating to the replacement of the contact tank at SEW WTW 1.

South Staffs Water acknowledged our assessment and challenges applied and reduced its allowance request by 20% for its water treatment works production resilience requests.

At draft determinations, West Yorkshire WTW was one of the schemes we provisionally determined not suitable for DPC. Yorkshire Water provided us with more detailed information in its representations, confirming that West Yorkshire WTW is likely to qualify as a DPC project as it will be sufficiently discrete. The company also provided further details to address some of the concerns raised in our draft determination assessment of the scheme as a resilience enhancement case.

Northumbrian Water acknowledged gaps in its initial evidence and accepted Ofwat's concerns about the link between backwash upgrades and climate change, as well as issues with optioneering and cost efficiency. The company challenged our 63% cost efficiency challenge, stating that the compounded adjustments for insufficient evidence, base overlap, and cost efficiency resulted in an overly harsh challenge. The company provided additional evidence to justify the link to climate change, the absence of base maintenance overlaps and

¹³⁹ Affinity Water, Anglian Water, Dŵr Cymru, Severn Trent Water, South East Water and South West Water

of improved optioneering and cost efficiency. It emphasised the low-regret nature of the investments, citing immediate climate risks and the need for long-term resilience under various scenarios.

Single source of supply

In response to the draft determination, Anglian Water considered that the evidence presented in its enhancement strategy outlined that the single point of failure programme was to manage increasing risks and risks outside management control. The company stated that the removal of these costs from its plan presents an ongoing resilience risk for 2025–30.

Dŵr Cymru did not accept our draft determination decision and sought reinstatement of the full allowance for its critical tanks proposal.

In our draft determination for Affinity Water we stated that the company should be undertaking the proposed investment within base expenditure allowances. Affinity Water accepted our draft determination decision and removed its funding request.

Smart networks

South East Water did not accept our draft determination decision and sought reinstatement of the full allowance for its smart water proposal.

In our draft determination for South Staffs Water we stated that the company should be undertaking the proposed investment within base expenditure allowances. South Staffs Water removed its request for funding for its smart water proposal and did not comment on our decision in its response to our draft determination.

Our assessment and reasons

Resilience interconnectors

No new resilience interconnector schemes were submitted to us in company representations, therefore our assessment focuses on reviewing the schemes as submitted in the companies' business plans. In response to the draft determination, we reallocate Northumbrian Water's request for resilience interconnectors to supply interconnectors based on the evidence submitted in its representation. Eight companies¹⁴⁰ are assessed at final determination.

For the final determination, we continue to apply the same enhancement assessment criteria to deep dive the schemes and apply our supply interconnector model to test the efficiency of the costs, pipeline lengths and capacity of each scheme.

¹⁴⁰ Affinity Water, Anglian Water, Dŵr Cymru, Severn Trent Water, SES Water, South East Water, South West Water and South Staffs Water.

Most of the remaining challenge in our assessment concerns the cost efficiency of delivering the pipelines for the resilience interconnectors. Where companies have provided sufficient and convincing evidence in response to our assessments at draft determination, we reduce our challenges to individual schemes. The most notable adjustments are for four companies, Dŵr Cymru, Severn Trent Water, South East Water, and South West Water. At draft determination we applied 30% to 60% challenges to these four companies and they now sit between 0% to 30%.

In response to WRSE's concerns on the importance of the sub-water resources zone improvements, we include all the proposed resilience interconnectors in the final determination. These has been assessed consistently against the enhancement assessment criteria.

Water production and supply resilience

For the final determination, we continue to apply the same enhancement assessment criteria to deep dive the schemes.

For the West Yorkshire WTW we still have residual concerns on the overlap with base and previous funding and if it is the best long-term option. However, we accept the need that an intervention is needed and that enhancement funding will be necessary. We accept that a DPC delivery route will be most appropriate based on size and discreteness.

We review the companies' evidence provided in their representations. As a result, we summarise these and respond to evidence provided in representations in our deep dive assessments for final determination. These can be found within the resilience enhancement model.

Single source of supply

For the final determination, we continue to apply the same enhancement assessment criteria to deep dive the schemes. We review the companies' evidence provided in their representations. As a result, we summarise these and respond to evidence provided in representations in our deep dive assessments for final determination. These can be found within the resilience enhancement model.

Smart networks

For the final determination, we continue to apply the same enhancement assessment criteria to deep dive the schemes. We review the companies' evidence provided in their representations. As a result, we summarise these and respond to evidence provided in representations in our deep dive assessments for final determination. These can be found within the resilience enhancement model.

Our final determination

Resilience interconnectors

At final determination, we respond to company's concerns on significant cost challenges producing a risk of non-delivery by reducing our challenges to reflect the quality of evidence provided at representation.

In their representations, companies asked for £414 million enhancement investment in resilience interconnectors, an approximately £9 million (2%) decrease when compared to £423m at draft determination. For final determination, we allow £360 million, a £143 million increase when compared to £217 million allowance at draft determination.

At final determination, we apply a price control deliverable (PCD) to all eight companies for customer protection for the delivery of resilience interconnectors.

Resilience (including water production, single source of supply, smart networks)

For the final determination, we provide total allowances of £844 million for resilience enhancement (excluding resilience interconnectors and the climate change resilience uplift), an increase from the £644 million allowed at draft determination.

Southern Water – Resilience enhancement investment

What we said at draft determinations: In our PR24 draft determination, Southern Water received an initial allowance of £32.5 million of the £304.3 million requested to upgrade four water treatment works (WTWs). The WTWs are subject to long standing DWI notices which the company should already have been addressing.

We passed SRN WTW1 and SRN WTW2 into the large scheme gated process, which requires the company to provide further evidence on deliverability and cost justification before releasing the remaining requested funds. We calculated the development allowance using the full request for these sites (£231.4 million). The company received 6% of this total upfront (£13.9 million), with the remaining funding contingent on successfully passing through the gated process.

SRN WTW3 and SRN WTW4 were assessed under the standard deep dive process. We provided £14 million after challenging costs that overlapped with base allowances and prior enhancement schemes.

These allocations reflected concerns about deliverability at SRN WTW1 and SRN WTW2 and the lack of sufficient evidence at SRN WTW3 and SRN WTW4 to demonstrate cost efficiency, rigorous optioneering, and alignment with enhancement criteria.

Stakeholders' representations: For the final determination, Southern Water's total request increased to £356.5 million from the £304.3 million requested at draft determination. This increase reflects the addition of a new request for £74.3 million to rebuild a fifth WTW (SRN WTW5), as well as cost reductions across SRN WTW1, SRN WTW2 and SRN WTW3, a cost increase at WTW4, and transitional funding requests for 2023–2025.

Our assessment and reasons: While we want to facilitate investment and improved resilience, we have concerns over cost efficiency and the need to protect customers from overpaying. The proposed costs are comparable to the cost of full WTW rebuilds¹⁴¹. This raises concerns about the effectiveness and efficiency of historical spending.

SRN WTW1 and SRN WTW2: We provide additional allowances to support resilience improvements at SRN WTW1 and SRN WTW2, recognising their importance in meeting Drinking Water Inspectorate (DWI) deadlines. We increase the development allowance from 6% to 12%, profiled evenly across 2024–25 and 2025–26, to support programme progression while requiring further evidence through the large gate process. This development funding reflects the need for company to progress these schemes quickly. The full transitional amount is rejected as this overlaps with work already necessary at these sites and is not bringing forward 2025–30 investment and deliverables.

We accept the company's additional engineering justification for its preferred options, which addresses some concerns raised at the draft determination. We expect more detailed optioneering evidence at the gated stages to ensure the proposals represent the best option for customers.

We challenge the efficiency of the proposed costs, as the company provides limited evidence of market engagement, benchmarking, or external validation. We have benchmarked ceramic membrane against other similar works and found Southern Water's costs were expensive in comparison. We retain cost efficiency concerns and expect stronger evidence at future gated stages.

SRN WTW3 and SRN WTW4: We partially pass the companies need for enhancement allowances at SRN WTW3 and SRN WTW4. We remove the transitional funding request of £30 million for 2023–25 due to a lack of sufficient or convincing evidence that this expenditure accelerates work planned for 2025–30, and is not duplicative of previously funded activities.

We remove the optioneering challenge as the company provides detailed engineering evidence demonstrating that the investments align with Drinking Water Inspectorate requirements.

¹⁴¹ Ceramic membrane WTW's at Homesford and Hampton Loade

We challenge the cost efficiency of the proposed investments as the company's benchmarking evidence represents less than half of the investment scope across the sites, leaving gaps in assurance.

SRN WTW5: We challenge £30 million of transitional funding requested for 2023–25, the company does not demonstrate that this expenditure accelerates enhancement delivery for the next price control period and is distinct from historically funded activities that the company has previously committed to.

The company provides sufficient evidence on optioneering for SRN WTW5 as it presents a comprehensive list of alternatives with associated costs and justifications.

We apply a cost efficiency challenge to WTW5. The company provides a market quote and an internal benchmark to justify its cost estimates but fails to present robust external assurance or evidence of extensive market engagement.

Our final determination: In our final determination, we allow £105.4 million for Southern Water's water treatment works (WTWs) upgrades, an increase from the £32.5 million provided at the draft determination. The contingent allowance for SRN WTW 1 and 2 is £252 million subject to passing through the large scheme gate process. This decision reflects additional evidence provided by the company, adjustments to development allowances and reassessed costs for specific sites.

We reject Southern Water's proposal to apply the enhanced cost sharing mechanism to the upgrades at SRN WTW1 and SRN WTW2 through the large gated process. We reject this mechanism for SRN WTW3, SRN WTW4 and SRN WTW5 because, although the mechanism aims to incentivise cost efficiency, our concerns about Southern Water's historical overspend and the potential risks to customer value lead us to conclude that it does not sufficiently protect customers.

South East Water – Resilience enhancement investment

£295 million requested, £228 million allowed

What we said at draft determinations: Within our draft determination we had significant concerns with South East Water's resilience claim of over £300 million. This was significantly higher than other companies, including much larger companies. South East Water, within its October 2023 submission, did not present a coherent resilience strategy, explain how discrete schemes interact, provide evidence it had considered overlap with

base and growth funding, or on optioneering and cost efficiency of its proposed investment. We made allowances of £91 million in the draft determination.

Stakeholders' representations: South East Water, within its representation to the draft determination, continued to make a significant enhancement request for resilience related spending (£295 million). This request included £166 million relating to treated water storage (a service reservoir), water treatment works improvements to increase its production and distribution resilience, and to update its network with modern monitoring equipment. It also requests £129 million to improve interconnectivity of its network. The company provides additional evidence on cost efficiency and optioneering and challenges our reallocation of supply interconnector investment to resilience interconnectors.

Our assessment and reasons:

South East Water provided improved evidence to support its proposed investment. This includes evidence that the investment will improve resilience to peak customer usage and is likely to resolve some of the resilience issues the company faces.

Smart network

We continue not to provide additional funding for the smart network proposals as the company does not present sufficient and convincing evidence why this investment is not covered by base expenditure allowances. Other companies are undertaking similar investments using base expenditure allowances.

Service reservoir and water treatment works

South East Water's benchmarking evidence supports that the company's costs presented for the draft determination are efficient for water treatment work upgrades and storage reservoirs. However, the company does not provide sufficient and convincing evidence for its increased costs associated with service reservoir storage. We therefore include an allowance for the six service reservoir storage improvements using the full amount requested in the company's October 2023 submission.

We allow the company's full funding requests for its SEW WTW 1, SEW WTW 2 and SEW WTW 4 resilience investments as the company has provided operational data to support the need for the schemes and improved evidence for optioneering.

We reject the company's request for an enhancement allowance at SEW WTW 3. The company does not provide sufficient and convincing evidence of the need for the scheme post completion of its 2020-25 improvements at SEW WTW 3. While the company demonstrates current issues at SEW WTW 3 it does not provide sufficient or convincing evidence SEW WTW 3 would continue to experience issues once the 2020-25 upgrade is

delivered. The company was not able to sufficiently explain the driver for this investment or the link to the WRMP.

Resilience interconnectors

We continue to reallocate seven interconnectors and assess these as resilience rather than supply schemes. These schemes, which include new connections and pumping investments, primarily address resilience, single point of failure and WINEP-driven needs resulting from localised impact of abstraction reductions. While some of the schemes may contribute to the company's supply-demand balance and have a Water Available for Use (WAFU) benefit, we have concerns over the supply modelling approach used to justify the need.

Two schemes are associated with interconnectors. These schemes address risks that should have been addressed by PR19 funded schemes. We remove the PR19 funded costs from the PR24 requested costs for these schemes. The company claims to have delivered resilience schemes elsewhere instead of the PR19 listed schemes. However, it is unclear that the benefits of alternative schemes are comparable, and outturn resilience improvement spend is lower than allowed at PR19.

Our final determination

Based on our challenges on need for enhancement (focussed on concerns with base overlap and customers double funding), optioneering and cost efficiency we make an allowance of £87 million to deliver water production and treated storage upgrades and £90 million to deliver improved interconnectivity. As a result of this we have significantly increased the company's allowance by more than £130 million in the final determination.

There is a residual risk that additional investment may be needed during 2025-30. To manage this residual funding risk, we allow a contingent allowance of £50 million for South East Water. This allowance is available to South East Water, subject to proving it is spending its enhancement allowances, its resilience programme is on target and that the company presents a submission identifying resilience schemes to be delivered. This allowance requires more in period scrutiny to expenditure.

The contingent allowance will allow the company to address issues in the 2025-30 period, protecting customers' interests and promoting long-term resilience. The company must support its submissions with assurance from an independent third-party provider with a duty of care to Ofwat, as we have set out in 'PR24 final determinations: Expenditure allowances – Assurance requirements for delivery of enhancement schemes appendix'.

Investment under the resilience contingent allowance is to manage increasing risks from hazards that are beyond their control and not covered by other enhancement areas or base allowance areas. It is essential that the company fully sets out the hazard the investment is

addressing. This investment category does not cover the failure of assets that are managed through maintenance. These are funded through base costs and are not within scope.

Give the need for the company to demonstrate progress, we expect the company to submit its contingent funding request no earlier than November 2026. We will return the £50 million, in full or in part, to customers if South East Water fails to submit a request for schemes, the request is poorly justified or doesn't deliver agreed investment to our satisfaction. South East Water is to propose a price control deliverable in its initial submission to incentivise timely and efficient completion of the work in the 2025–30 period. The changes in funding from the allowed £50 million will be reconciled at PR29.

3.8.2 Climate change resilience uplift

What we said in our draft determinations

At draft determination we found that most companies were unable to adequately justify their investment cases for flood and power resilience, particularly in relation to increasing climatic risks. However, we acknowledged that the impacts of climate change are real, long standing and sector wide, and the lack of robust justification from companies does not remove the risk. We therefore proposed to allow a sector wide enhancement uplift based on 0.7% of modelled base allowances (for water and wastewater services) resulting in over £300 million across the industry at draft determination. We requested that companies set out what schemes they will deliver for the additional uplift funding in their representations, including details of the schemes and why these have been prioritised to address the biggest risks from climate change.

Stakeholders' representations

We received representations from 16 companies on our approach to the climate change resilience uplift.

- Seven companies¹⁴² support the draft determination approach and set out what they will deliver for the climate change resilience uplift funding.
- South West Water, Bristol Water, and South East Water clearly state their preference to forgo the allowance.
- Anglian Water, Severn Trent Water and Southern Water did not agree with the proposed sector wide uplift based on 0.7% and provided additional evidence for a larger allowance.

¹⁴² Dŵr Cymru, Hafren Dyfrdwy, Thames Water, Yorkshire Water, Affinity Water, Portsmouth Water, and South Staffs Water

- Northumbrian Water, United Utilities and Wessex Water do not consider a sector wide uplift to be an appropriate way to fund companies. Instead, they suggest that Ofwat should consider the information set out within company plans and set the appropriate level of funding on a company by company basis, having taken due consideration of the specific climate risks each company is facing.
- Affinity Water highlight that, given the emerging nature of climate risks, a degree of flexibility in the targeting of this expenditure within period will ensure customers receive the greatest protection of services possible for the investment.
- Eight companies¹⁴³ request more than 10% above the climate change resilience uplift given at draft determination for water and/or wastewater areas in their representations.

The Environment Agency welcomes the proposed enhancement uplift for companies to prioritise their biggest climate related risks, but has concerns that a high percentage of requested expenditure on flood resilience was not allowed because of poor evidence.

Our assessment and reasons

At draft determination, we requested that all companies should set out what they would deliver for the proposed allowance in their responses to address their biggest risks due to climate change impacts.

For companies that requested funding close to the climate change resilience uplift at the draft determination (based on 0.7% of the base expenditure allowance), we check that the company has complied with the climate resilience uplift requirements we set at draft determinations. This applies to ten¹⁴⁴ companies' proposal for water and five¹⁴⁵ companies' proposal for wastewater.

For companies requesting more than 10% above the proposed climate change resilience uplift, we have deep dived requests to assess need, optioneering, and cost efficiency. We apply deep dives to Dŵr Cymru, Northumbrian Water, Portsmouth Water, SES Water, Severn Trent Water, Southern Water, United Utilities and Wessex Water. Further detail on our assessments is covered in the relevant deep dive assessments of the water and wastewater resilience models.

In addition to its original proposal to protect critical water and wastewater assets from the increasing risk of flooding, Dŵr Cymru includes a new scheme "Water Treatment Works (WTW) Chemical Storage Improvements" in its representation, taking the total request 10% above the climate change resilience uplift. Following our deep dive assessment, we reject this scheme as the proposed inventions overlap with the expectations from base expenditure. Asset maintenance for continued delivery of service is included in base allowances. If

¹⁴³ Dŵr Cymru, Portsmouth Water, Northumbrian Water, Severn Trent Water, SES Water, Southern Water, United Utilities, Wessex Water.

¹⁴⁴ Affinity Water, Anglian Water, Hafren Dyfrdwy, Northumbrian Water, Severn Trent Water, South Staffs Water, Southern Water, Thames Water, Wessex Water, and Yorkshire Water.

¹⁴⁵ Anglian Water, Dŵr Cymru, Hafren Dyfrdwy, Thames Water and Yorkshire Water.

required, the company should be undertaking the investment within base expenditure allowances.

Following our assessment, Northumbrian Water partially meets the deep dive criteria to enhance their climate change resilience for flooding and power in wastewater. Northumbrian Water partially met the deep dive criteria for flooding resilience, based on addressing all high and medium flood risk sites, however the company does not provide sufficient evidence to justify that additional funding is required to address low risk sites.

Northumbrian Water's representation on power resilience did not provide sufficient and convincing evidence that it would be more impacted by storms than its regional neighbours. The representation also focuses on the provision of fixed generators whereas other companies are considering a wider range of solutions including lower cost mobile generation. We have reviewed Northumbrian Water's historic pollution records and identify six sites within its power resilience proposals that have a history of repeated pollution incidents caused by power outage. We therefore make additional allowance to address power resilience at these sites. We will hold the company to account for this additional allowance with a price control deliverable (see 'PR24 final determination: Price control deliverable appendix').

We separate the assessments for Severn Trent Water and United Utilities expenditure requests to improve flood resilience from the climate change resilience expenditure allowances due to the participation of local partnerships and delivering catchment and nature based solutions. We want to encourage companies to work with partners to provide catchment-based flood resilience. We deep dive both requests. The companies provide sufficient and convincing evidence to demonstrate the needs of the additional enhancement expenditures to enable partnerships to improve flood resilience for the proposed catchments, in part as both companies have historically invested significantly more than the implicit allowance for reducing risk of sewer flooding, thereby ensuring there is no overlap with base expenditure. We make full allowances for both schemes. We will hold the companies to account for this additional allowance with a price control deliverable (see 'PR24 final determination: Price control deliverable appendix').

In its response to our draft determination for power resilience, Wessex Water restates the challenges of power resilience due to climate change impact to its wastewater treatment works. However, the company does not provide sufficient and convincing evidence to justify its proposed provision of standby generators at all wastewater treatment works with a numeric permit. The meeting of existing permit conditions is funded from base allowances. Therefore, for the final determination we reject Wessex Water's additional request in power resilience for their wastewater treatment works.

Our final determination

For the final determination, we adjust our draft determination assessment for climate change resilience uplift from 0.7% to 0.714% based on the base expenditure allowance.

We allow climate change resilience expenditure allowance for water of £142 million and wastewater of £212 million, resulting in totalled £354 million at final determination, a £50 million increase from £304 million at draft determination.

These enhancement allowances, on top of the implicit base allowance, should be sufficient for companies to manage the risks from climate change to flooding and power resilience. We apply a Price Control Deliverable for companies to evidence the efficient delivery of schemes that meet the climate resilience criteria, and will hold companies to account for the efficient delivery of schemes for the benefit of customers. (see 'PR24 final determination: Price control deliverable appendix')

Our allowances support the national flood and coastal erosion risk management strategies for England and for Wales. In addition to the climate resilience uplift which will help address flooding risks we also provide additional funding through other enhancement areas. For example, Anglian Water's A-WINEP 'Partnership Centre of Excellence' will support collaborative work in flood risk management. We also provide support through our base expenditure allowances which includes an allowance for companies to reduce sewer flooding. In England, this supports the outcome that 'national infrastructure will be more resilient to current and future risks from flooding and coastal change

3.8.3 Reservoir safety

What we said in our draft determinations

PR24 reservoir safety enhancement requests are significantly higher than those at PR19. Companies are expected to fund capital maintenance to ensure reservoir safety through base expenditure, additional investment allowances are provided only for step change requirements.

At PR19, there were few requests for additional funding beyond what was covered by base model allowances. Approximately £100 million was allowed as enhancement or base cost adjustment claims above base allowances for reservoir safety. A significant portion of this funding was allocated to address small reservoirs falling under the Reservoirs Act for companies operating in Wales.

In our PR24 draft determination, we raised concerns over the uncertainty of future drivers for reservoir safety spending and the risks that companies' expenditure claims should have been delivered in previous price review periods through base expenditure allowances. We challenged claims for overlaps with previous funding, base maintenance, best option, and cost efficiency. This resulted in an allowance of £154 million, representing 37% of the requested £415 million.

Stakeholders' representations

For the final determination, several companies revised their total funding requests. Southern Water increased its request due to updated cost estimates and scope certainty following Reservoir Act Section 10 inspection reports, which identify auxiliary spillway construction. Hafren Dyfrdwy increased its request to reflect scope adjustments and newly identified statutory requirements for specific sites, removing costs previously covered by the National Environment Programme (NEP). Northumbrian Water refined its scope by focussing on reservoirs where cost-efficient standardised siphon designs could be implemented, high-cost projects were deferred to later periods, and less critical or uncertain activities were removed, leading to a reduction in its total request. Severn Trent Water reduced its request by focusing on essential “no regrets” investments, removing activities with uncertain drivers or overlaps with base maintenance.¹⁴⁶

In response to our draft determination decisions, stakeholders, including Natural Resources Wales and the Environment Agency, alongside companies, raised several concerns. We summarise these as follows:

- **Base maintenance overlaps:** Dŵr Cymru and Northumbrian Water stated that their proposals did not overlap with base maintenance activities but addressed new statutory drivers and technical guidance, such as the drawdown capacity guidance (2017).¹⁴⁷ and the Flood and Reservoir Safety 4th Edition (2014).¹⁴⁸ These companies stated that Measures in the Interests of Safety (MITIOS) – mandatory actions required to address identified safety risks under the statutory Reservoirs Act 1975 – reflect a step change in requirements. United Utilities stated that its enhancement claims included infrastructure upgrades to address safety risks, including post-Balmforth MITIOS actions.¹⁴⁹ The company stated that the key driver of increased costs is the higher number of statutory safety actions issued per inspection following the Toddbrook incident, rather than an increase in the frequency of inspections. United Utilities emphasised that this step change in actions per inspection, along with their higher complexity and cost, could not have been addressed previously through base funding.
- **Legislative uncertainty:** Thames Water and Severn Trent Water stated that their enhancement claims are related to anticipated amendments to the Reservoirs Act 1975. They stated that proactive funding is necessary for preparatory inspections and remedial works to manage risks ahead of these changes being implemented. Hafren Dyfrdwy and Dŵr Cymru stated that continued compliance with existing legislative requirements for

¹⁴⁶ “No regrets” investments are defined as preparatory works that deliver value under current circumstances and mitigate future risks, irrespective of the precise timing of legislative or regulatory changes.

¹⁴⁷ [Guide to drawdown capacity for reservoir safety and emergency planning – GOV.UK](#)

¹⁴⁸ [Floods and Reservoir Safety, Fourth Edition, Institution of Civil Engineers, 2015](#)

¹⁴⁹ In August 2019, following two heavy rainfall events, the secondary spillway at Toddbrook Reservoir in Whaley Bridge, owned by the Canal and River Trust, started to fail despite being fully compliant with the Reservoirs Act 1975. Following the incident the Government asked Professor Balmforth to undertake an independent review, to consider the effectiveness of reservoir safety legislation and regulations. This resulted in recommendations published in May 2021. The Balmforth review includes 15 recommendations with a range of focus from professional standards for inspecting reservoirs, more steer for EA in good practice and applying more stringent risk categorisations to prioritise actions. Many of these recommendations have not been implemented and some require legislative change (e.g. risk categorisations).

smaller reservoirs already regulated under the Reservoirs Act in Wales is essential, particularly in response to stricter expectations following the Balmforth review.

- **Statutory drivers and “no regrets” investments:** Dŵr Cymru, Severn Trent Water, and Thames Water stated that their enhancement proposals are required to address critical safety risks and align with statutory drivers. Investments in spillway upgrades, drawdown improvements, and other interventions were presented as “no regrets” solutions that will reduce future risks and ensure compliance, even if the timing of certain legislative changes remains uncertain.
- **Updated flood mapping:** United Utilities raised concerns about the implications of the Environment Agency’s updated flood risk mapping. The company stated that the revised flood maps significantly increased the level of regulatory scrutiny on reservoirs which were previously assessed as lower risk, making additional investment necessary.
- **Regulatory alignment:** The Environment Agency stated that final determination decisions must enable companies to meet their legal obligations under the Reservoirs Act 1975. It highlighted the importance of aligning allowances with a risk-based framework that ensures public safety and environmental protection. Natural Resources Wales also emphasised the need for allowances to reflect statutory requirements, particularly in Wales, where the Reservoir Act has been extended to smaller reservoirs.
- **Proactive safety measures:** The Environment Agency and Natural Resources Wales stated that achieving compliance with legal minimum requirements does not guarantee public safety. They advocated for proactive investments, including measures aligned with the Balmforth review recommendations. Natural Resources Wales referenced the Health and Safety Executive’s risk management framework, as an important standard for ensuring safety and environmental protection.

Our assessment and reasons

We have considered feedback from companies and stakeholders as follows:

Need for enhancement: There are three key drivers of enhancement investment identified by companies:

- Changing size threshold for reservoirs falling under the Reservoirs Act 1975.
- New technical guidance for reservoir owners to ensure compliance.
- Increased interventions due to additional scrutiny following the Balmforth review.

Continuing with our approach used in the draft determinations, we provide allowances to address these drivers so that companies can undertake safety-critical activities. We make allowances for small reservoirs in Wales (between 10Ml and 25Ml of storage above ground level) regulated under the Reservoirs Act 1975 since 2016.¹⁵⁰ This aligns with Natural Resources Wales’s statement on ensuring compliance with existing legislative requirements. For Dŵr Cymru and Hafren Dyfrdwy, we provide allowances for schemes clearly driven by

¹⁵⁰ A raised structure or area is “large” (under the 1975 Act) if it is capable of 10,000 cubic metres (in Wales) of water above the natural level of any part of the surrounding land. In England the holding is 25,000 cubic metres.

statutory requirements, such as specific MITIOS actions and upgrades for small reservoirs. We continue to challenge requested costs where there is insufficient evidence demonstrating that they do not overlap with base maintenance allowances.

We provide allowances for meeting recent technical guidance changes, such as the 2017 drawdown capacity guidance and the Flood and Reservoir Safety 4th Edition (2014). These changes often necessitate large infrastructure upgrades, including new or improved spillways and drawdown arrangements. Residual concerns remain that some upgrades could have been addressed through base expenditure, but we provide these allowances to ensure compliance with updated statutory and regulatory requirements, consistent with representations from Natural Resources Wales and the Environment Agency.

Base maintenance requests: We challenge company requests for generic maintenance activities or studies without clear statutory drivers. The company base allowances, as they have in previous price review periods, are sufficient for companies to undertake these interventions. Where companies provide detailed site-specific evidence and align proposals with statutory drivers, such as United Utilities' post-Balmforth MITIOS actions or Northumbrian Water's siphon designs, we treat these as enhancement claims rather than base maintenance. This is consistent with the Environment Agency's expectation that investment aligns with legal obligations under the Reservoirs Act 1975 and Natural Resource Wales advocacy for higher standards than the minimum legal requirements.

Uncertainty of legislative changes: Our allowances reflect a consistent approach to proactive funding for future compliance. For companies in England, while legislative changes remain uncertain and are anticipated after 2027, we provide relatively small allowances for "no regret" investments such as preparatory inspections and remedial works to proactively manage risks. This helps to ensure that safety risks are addressed now rather than deferred. For companies in Wales, we already support compliance with the already extended Reservoirs Act 1975 requirements for smaller reservoirs.

Cost efficiency and benchmarking: We challenge costs where companies fail to provide sufficient evidence of cost efficiency or when proposed costs exceed comparable benchmarks. For example, we use benchmarked unit rates, such as in Thames Water's case, developed through comparisons with industry-wide data. When companies support their claims with robust third-party assurance or benchmarking evidence, we accept higher allowances to reflect efficient delivery costs for site-specific interventions. This ensures that the allowances align with the Health and Safety Executive risk management framework, as referenced by both Natural Resources Wales and the Environment Agency.

Risk management: United Utilities proposed £115 million for Portfolio Risk Assessment (PRA) activities. We provide a total allowance of £105 million for risk reduction activities with clear statutory alignment, ensuring compliance with safety-critical requirements. We challenge costs where risk reduction is disproportionate to cost. Our approach aligns with

the Environment Agency's and Natural Resources Wales's emphasis on funding measures that ensure statutory compliance while supporting proactive risk management.

Our final determination

For the final determination, we provide total allowances of £354 million for reservoir safety enhancement, an increase from the £154 million allowed at draft determination.

The increase in allowances reflects improved evidence, revised scopes, and alignment with statutory drivers and guidance. Companies clarified their claims, particularly for safety-critical activities and legislative requirements. Revised scopes addressed uncertainties and aligned with regulatory expectations, including proactive risk management. Robust benchmarking and third-party assurance supported efficient cost adjustments, ensuring compliance and effective risk management.

We provide allowances only where companies demonstrate that claims represent enhancement activities beyond base funding expectations. We challenge costs lacking efficiency evidence, overlapping with base maintenance, or without clear links to enhancement drivers. Final allowances increased significantly but remain £48 million below total requested amounts, focusing on statutory and safety-critical needs.

Our analysis highlights that some companies allocated relatively low proportions of base expenditure to reservoir assets. For example, from 2011-12 to 2022-23, United Utilities allocated 26% of base water resources expenditure to reservoir assets, despite sourcing over 50% of its water from reservoirs. By contrast, Yorkshire Water, which has many reservoirs (third most by number), does not make an enhancement request and its base water resources spend is comparable to the proportion of water sourced from reservoirs. This suggests some companies may not have proactively addressed reservoir risks through base maintenance in previous years.

Our allowances ensure companies meet statutory standards and deliver necessary safety improvements. This approach avoids risks of deferring critical activities due to claims of inadequate funding. Over the next period, we will track total expenditure, including base and enhancement allowances, on large raised reservoir assets to better understand investment patterns.

Overall allowances for resilience enhancement expenditure

In total we allow £2.3 billion for resilience enhancement investment across general resilience, interconnectors, reservoir safety and climate change uplift. This expenditure will help to support the national flood and coastal erosion risk management strategies for England and for Wales. The climate change uplift will support activities to mitigate climate change, including flooding. We are also allowing funding through other areas of our enhancement, for example Anglian Water's A-WINEP 'Partnership Centre of Excellence' that

will support collaborative work in flood risk management. We also provide support through our base expenditure, for example, through our funding to reduce sewer flooding. In England, this supports the outcome that 'national infrastructure will be more resilient to current and future risks from flooding and coastal change'.

Table 29: Final determinations resilience enhancement allowances

Company	General resilience (£m)	Resilience climate change uplift (£m)	Resilience interconnector (£m)	Reservoir safety (£m)	Total resilience (£m)
Anglian Water	0.00	28.97	6.80	0.00	35.77
Dŵr Cymru	25.90	18.97	43.94	70.28	159.10
Hafren Dyfrdwy	0.00	1.13	0.00	13.46	14.59
Northumbrian Water	78.32	17.13	0.00	64.05	159.50
Severn Trent Water	9.50	42.26	131.46	22.12	205.34
South West Water	0.00	0.00	67.55	0.00	67.55
Southern Water	441.52	20.99	0.00	26.17	488.67
Thames Water	451.30	65.87	0.00	10.36	527.52
United Utilities	90.66	27.57	0.00	148.67	266.90
Wessex Water	2.89	11.54	0.00	0.00	14.43
Yorkshire Water	23.37	27.57	0.00	0.00	50.94
Affinity Water	0.00	8.83	12.25	0.00	21.09
Bristol Water	0.00	0.00	0.00	0.00	0.00
Portsmouth Water	3.59	1.36	0.00	0.00	4.95
South East Water	137.07	0.00	90.42	0.00	227.50
South Staffs Water	4.10	3.86	7.18	0.00	15.14
SES Water	1.07	1.38	0.32	0.00	2.77
Total	1269.28	277.44 ¹⁵¹	359.92	355.10	2261.74

¹⁵¹ Northumbrian Water, Severn Trent Water, and United Utilities have had additional an climate change uplift through deep dive which is included in general resilience in this table and therefore the climate change uplift column does not equal the £354 million quoted in text

3.8.4 Security and Emergency Measures Direction

Under Section 208 of the Water Industry Act 1991¹⁵², the Secretary of State and Welsh ministers can give English and Welsh water companies directions in the interests of national security (for water and wastewater assets) or for the purpose of mitigating the effects of any civil emergency. In February 2022 the Security and Emergency Measures Direction 2022 (SEMD)¹⁵³ was updated following a consultation by Defra. For security elements this amended the criteria for designation to protect Critical National Infrastructure (CNI) and National Infrastructure (NI) assets¹⁵⁴, resulting in additional CNI designated assets across the industry. Not all companies require investment to meet the updated standards, with some companies not receiving new CNI designations and already meeting the expected standards with existing security measures.

For emergency planning and alternative water provision this amended the requirement to provide a minimum percentage of each company's domestic population or reasonable worst-case scenario. Not all companies require investment to meet the minimum standard as some companies already meet the standard with existing provisions.

What we said in our draft determinations

Security

At draft determination we set out that the Drinking Water Inspectorate (DWI), on behalf of the Secretary for State and Welsh Ministers is responsible for the regulation and enforcement of SEMD. Companies must carry out risk assessments for every water treatment works and associated supply system (that is from source to tap) to establish whether there is a risk to the supply of water that could constitute a potential danger to human health from inadequate capabilities (as defined in the SEMD guidance).

The DWI assess company proposals for improving security aligned with SEMD 2022 and generate legal instruments to confirm delivery. We validate the need for company investment plans based on DWI legal instruments and the number of CNI and NI sites to be addressed. We deep dived material company requests as a benchmarking approach was not robust. In the deep dives we validated the need and assessed evidence for best option and cost efficiency. We adjusted for base overlap and previous funding where companies did not provide sufficient and convincing evidence that all investment was new enhancement or provided any quantification of a base implicit allowance. We made these adjustments as many sites will already have security measures and be categorised as CNI or NI assets. Therefore, the requests could overlap with maintenance of current assets or to get sites up to the standard they should have achieved under previous security classifications within the

¹⁵² [Water Industry Act 1991](#)

¹⁵³ [The Security and Emergency Measures \(Water and Sewerage Undertakers and Water Supply Licensees\) Direction 2022](#)

¹⁵⁴ [NPSA, Critical National Infrastructure](#)

2020-25 period. Twelve companies requested expenditure and our draft determination allowances in this area represented a significant uplift compared to PR19. Where companies requested new or additional enhancement costs in representations, we expected sufficient and convincing evidence to include, amongst other things, why it was not part of their draft submissions.

Emergency Planning and Alternative Water Supplies

For emergency planning and alternative water supplies (EP/AWS) from 1 April 2025 companies need to plan to provide emergency water supplies to a minimum of 1.5% or reasonable worst-case scenario of their domestic population based on ten litres of drinking water per person per day, for up to 120 hours (five days). Companies are encouraged to exceed this minimum planning requirement if their reasonable worst-case scenario would impact more than the minimum percentage of their population served. The DWI assess company proposals for improving emergency water supplies aligned with SEMD 2022 and generate legal instruments to confirm delivery.

We validated company requests for increased emergency supply provision compared to previous standards. We did not provide additional allowances where there is no increase in requirement compared to previous standards, save for South West Water where we have taken account of the recent supply availability issues and related alternative water supply proposals supported by the DWI with a legal instrument. For the remaining requests, we deep dived the proposed allowances by examining optioneering and cost efficiency. We compared the requested and allowed costs against any increase in population variance to meet new requirements. We did not use a benchmark directly to set allowances due to cost allocation uncertainties, limited data points and variations in solutions proposed (across the nine companies requesting in this area).

We expected companies to clearly show how operational responses (as funded under alternative water supplies) interact with other areas of resilience enhancement requests. Several company plans were unclear how alternative water supply interventions interact with proposed infrastructure upgrades. We expect there to be synergies between the two types of expenditure and expect companies to evidence that requests are not asking customers to pay twice to resolve the same risk.

Stakeholders' representations

In response to our draft determination decisions, the DWI, Thames Water and Southern Water raised the following points.

The DWI responded that draft determinations for SEMD have considered and reflect the inputs and advice from DWI towards achieving a reasonable allowance for some companies. The DWI raises concerns that the lack of sufficient and convincing evidence has led to a cost challenge for some companies that may not allow those companies to fully meet their

statutory obligations in line with the legal instruments that have been put in place. The DWI states that these allowances are likely to increase when companies provide additional information.

In the draft determination we proposed to allocate Thames Water security proposals to be assessed as part of the large scheme gated process, due to the large cost and scope uncertainties. Thames Water requested £472 million and we allowed 6%, £28 million of these costs for investigations and solution development, with the remainder contingent on the further development of the scheme. Thames Water agreed with our approach.

Southern Water significantly increased its request from £10 million to £47 million for security related enhancement expenditure. The company stated that this is a result of Defra requirements to upgrade two CNI sites and to enhance two newly designated sites to CNI standards as its original draft determination proposal failed to meet protective security guidance and consider delivery complexities. Following further investigation by the DWI in March 2024, the DWI initiated enforcement for security deficiencies not covered by the existing undertaking. The company submitted an additional SEMD scheme to the DWI for consideration in July 2024 which the DWI supported the need for the scheme and issued a letter of support, SEMD SRN7 – SEMD Enhancement – CNI Sites Upgrade. In October 2024 the DWI accepted the new security undertaking from the company, SRN-2024-00014.

Our assessment and reasons

We continue to deep and shallow dive expenditure for final determinations. Where challenged at draft determinations, companies provide additional evidence to our cost challenges. Based on the additional evidence we increase our allowances. We continue to challenge companies where evidence is not sufficient and convincing.

United Utilities and Affinity Water do not represent on our cost challenges for base overlap (£22 million and £0.4 million respectively), whilst others (Anglian Water, Dŵr Cymru, Northumbrian Water, South West Water, Severn Trent Water, Thames Water, Yorkshire Water and South East Water) maintain their water and wastewater cost requests. Southern Water significantly increasing its security representation by £37 million.

For Thames Water we allow its security proposals for investigation and solution development expenditure. We will assess the remaining security contingent expenditure through the large scheme gated process.

For Southern Water we have assessed the additional scheme expenditure through our deep dive assessment approach and make further allowances.

We have amended the requested allowances where companies have made representation amendments.

We consider that with the additional evidence and amended allowances submitted by companies, that our assessment approach allows sufficient allowances to address the concerns raised by the DWI to meet legal instruments.

Our final determination

We have considered the additional evidence presented by companies and further engagement with DWI to make our final determinations. Company's representations request an expenditure allowance of £765 million. Through our assessment process we are making final determination allowances of £747 million, with a contingent allowance of £443 million for Thames Water security programme to be considered as part of the large scheme gated process. This makes a total expenditure allowance of up to £747 million and represents a 9% increase on draft determinations.

With this additional funding we expect companies to improve performance in addressing operational issues and ensuring that customers continue to receive secure supplies, and timely access to alternative supplies where necessary.

We continue to include PCD's for customer protection for SEMD proposals based to the DWI legal instruments.

3.8.5 Cyber security

Companies' drinking water supply and distribution services are required to be resilient against 'limited capability attacks' by March 2025 and against 'moderate capability attacks' by March 2028, following Government guidance¹⁵⁵ and Drinking Water Inspectorate (DWI) requirements¹⁵⁶. Companies requested enhancement funding to increase the resilience to cyber-attacks aligned with the increasing standards and threat requirements.

What we said in our draft determinations

At draft determination we acknowledged the increased risks and cyber resilience requirements for water services, and we expected all companies to manage their cyber maturity across all areas of their business, including wastewater and retail services. We expected companies to provide independent evidence of current and future (2030) cyber maturity across each area of their business (water, wastewater and retail)¹⁵⁷ and for background evidence on the relevant cyber maturity framework to also be provided. We noted that we would revisit this issue for final determinations.

¹⁵⁵ NCSC, [Introduction to the Cyber Assessment Framework](#)

¹⁵⁶ DWI, [Network and Information Systems \(NIS\) Regulations policy](#)

¹⁵⁷ Companies should clearly state where they do not have independent evidence of cyber maturity.

We assessed material company requests for water cyber security using deep dives. We adjusted for base overlap and previous funding where companies did not provide sufficient and convincing evidence that all investment is new enhancement or offer any quantification of a base implicit allowance. For some cost requests there was overlap with base maintenance due to requests for replacement of older operational technologies with modern equivalents. These assets should be replaced using base allowances. We have also challenged company proposals on suitability of optioneering and cost efficiency.

In the draft determination we stated that wastewater services are not included within the scope of the Network and Information Systems Regulations 2018. We were not aware of any immediate plans and timescales to include wastewater services within the scope of the regulations and therefore rejected all enhancement costs for wastewater services.

Stakeholders' representations

In response to our draft determination decisions, stakeholders raised several points. We summarise these as follows.

The DWI response stated that engagement with Ofwat has been open and well managed, with supplementary meetings with senior staff. The DWI supports Ofwat's objective to challenge companies towards providing the most efficient and best option for customers. The DWI were concerned over the scale of the efficiency challenge at draft determination.

Severn Trent Water, Southern Water, Thames Water, Yorkshire Water, Portsmouth Water, South East Water provided additional evidence to support requested expenditure allowances.

Anglian Water said that it expected the draft determination shallow dive efficiency to reduce at final determination and removed wastewater recycling costs following discussion with DWI.

Three companies include costs for wastewater operational technology and supporting wastewater information technology systems that could present a residual risk through cyber-attacks to the continuous supply of wholesome drinking water.

Anglian Water, Northumbrian Water, Southern Water, United Utilities, Wessex Water and South East Water reduce their expenditure requests, through including additional programme efficiencies and/or accepting base overlap challenge.

Our assessment and reasons

We have undertaken further extensive engagement with Defra, DWI and National Cyber Security Centre (NCSC) to better understand company proposals, risks and scope of future cyber expenditure.

We have continued to work with the DWI to confirm the scope and residual risks from integrated wastewater systems. The DWI confirmed, September 2024, that where a company's wastewater operational technology and any wastewater supporting information technology systems could present a residual risk through cyber-attacks to the continuous supply of wholesome drinking water, that these risks should be assessed and mitigated where appropriate. We therefore now assess additional wastewater costs for three companies. Risks to other companies from wastewater systems were either already mitigated or did not require enhancement expenditure to mitigate.

We continue to deep and shallow dive company expenditure requests. We continue to challenge companies where there is insufficient evidence on overlap with the expectations from base expenditure or cost efficiency. We also now assess wastewater requests where the DWI has confirmed a residual risk through cyber-attacks to the continuous supply of wholesome drinking water.

Our final determination

Based on the additional evidence provided by companies, we allow a total expenditure allowance of £455 million out of a total company request of £495 million. This represents an 8% challenge on company cost proposals and a £210 million increase in allowances compared to draft determinations. This includes expenditure to improve the cyber resilience of wastewater systems where this is required to protect the provision of drinking water. We consider that this expenditure allowance is sufficient for all companies to maintain and improve the cyber resilience of their systems, technology and processes and to meet their statutory obligations and DWI legal instruments. Water companies have duties to maintain a water supply system and, where relevant, provide a wastewater system, so that, among other things, they continue to meet their statutory water supply and wastewater service obligations.

We apply a Price Control Deliverable for customer protection based to the DWI legal instruments.

Cyber resilience is an emerging and fast-moving area. It is critical that water companies are resilient against cyber threats to allow the continued supply of drinking water. We are therefore including an uncertainty mechanism in the 2025-30 period. This uncertainty mechanism will apply to any significant increase in costs due to any new or changed legal requirements on cyber security or changes in relation to the level of threat. By significant we consider the costs would need to exceed the shallow dive threshold of 0.5% of relevant wholesale totex or £10 million. If these changes arise, we will undertake an in-period assessment of additional costs, and where costs are material, we will allow additional costs to be recovered in period. If costs are not material, then we will allow them to be recovered at the end of the period. We do not expect companies to wait for additional expenditure allowances to address new or emerging risks that are identified during the price control period. If companies consider a relevant change has occurred and would like to recover

additional expenditure allowances then we expect that they will need to submit an additional expenditure request together with details of how this meets the requirements of the uncertainty mechanism in March 2026 or March 2027. We expect any changes to requirements after this date to be reflected in PR29. Further detail of the proposed uncertainty mechanism is set out in PR24 Final Determinations: In-period adjustment.

Table 30: Final determinations security enhancement allowances

Company	SEMD (£m)	Cyber (£m)	Total security (£m)
Anglian Water	16.21	28.79	44.99
Dŵr Cymru	18.74	10.98	29.71
Hafren Dyfrdwy	0.00	1.46	1.46
Northumbrian Water	31.10	8.03	39.13
Severn Trent Water	67.83	69.30	137.13
South West Water	3.12	9.19	12.31
Southern Water	43.64	94.39	138.03
Thames Water	500.36	114.51	614.87
United Utilities	22.40	14.62	37.03
Wessex Water	0.00	19.11	19.11
Yorkshire Water	22.38	31.06	53.44
Affinity Water	4.85	5.61	10.46
Bristol Water	1.63	3.41	5.04
Portsmouth Water	1.67	11.99	13.66
South East Water	10.86	27.86	38.72
South Staffs Water	0.53	4.10	4.63
SES Water	1.49	0.34	1.83
Total	746.80	454.75	1,201.55

3.9 Growth at sewage treatment works

Growth at sewage treatment works expenditure relates to the costs for upgrading sewage treatment works to accommodate population equivalent (PE) growth in the catchment area. Although population growth is the underlying driver of need, companies will make decisions on whether and how to upgrade their works also considering the availability of headroom at the works. We provide enhancement expenditure allowances to fund changes in permit conditions to accommodate population growth. However, we will not provide enhancement funding for making up for previous non-compliance with permit conditions.

At PR19, growth at sewage treatment works was included as part of the base cost econometric models, with deep dive analysis of company business plan proposals where necessary. This expenditure is now assessed separately. This follows an Arup recommendation for separate company level econometric models to assess growth-related costs.¹⁵⁸ However, some companies raised concerns that company level models would fail to account for headroom in capacity at sewage treatment works. We therefore collected scheme-level data at PR24.

Dry weather flow (DWF) is the average daily flow to a sewage treatment works during a period without rain. This average flow will increase if the population equivalent in the catchment area grows. Flow-to-full treatment (FFT) refers to the flow a sewage treatment works must treat before it is permitted to discharge excess flows to storm tanks or the environment. As a minimum, a site must treat all flows up to a limit specified in the site's permit. The Environment Agency and Natural Resources Wales set and monitor DWF and FFT permits. A DWF permit increase might consequently require an increase in the FFT permit. Increase to DWF can also impact the level of treatment required at the works. For example, to prevent deterioration in the receiving watercourse following population equivalent growth, the works might need to meet higher final effluent water quality standards. This will require investment in the treatment works if the tighter permit cannot be achieved through existing assets.

What we said in our draft determinations

At draft determinations, we collected detailed data on each proposed PR24 growth scheme, including the expected changes in DWF, FFT, and other permits, as well as current annual levels of compliance with DWF permits and overlaps with other WINEP/NEP schemes.

We estimated and triangulated between two scheme level econometric models to assess efficient costs, which included the following drivers.

- Scale drivers:
 - expected change in PE served from 2024-25 to 2029-30 (model 1);

¹⁵⁸ Arup – Assessment of growth-related costs at PR24

- expected process capacity added to meet current and expected quality permits (model 2).
- Other drivers (both models):
 - expected change in Dry Weather Flow permit;
 - dummy variable indicating if sewage treatment works ammonia permit is decreasing and will be below 3mg/l, due to the engineering step change in process intensity to maintain compliance.

We expect companies to meet existing DWF and FFT permit levels through base expenditure allowances. Companies have provided assurance that allowances were sufficient to meet these obligations in the past. As our base expenditure allowances are based on historical expenditure, we continue to expect companies to be able to meet these existing obligations going forwards. We therefore excluded schemes to prevent overlap with base costs, including where companies were updating their FFT permit with no associated increase in the DWF permit. We deep dived schemes that were either identified as statistical outliers or inherently unsuitable to model (for example new sites). Companies provided assurance that where sites were non-compliant with their DWF permit, none of the proposed expenditure on growth at sewage treatment works would be used on remediating non-compliance.

In addition to the modelled and deep-dive allowances, we made an additional adjustment to account for previous funding. Growth at sewage treatment works expenditure was funded in PR19 through base expenditure and in PR14 through total expenditure allowances, but the actual spending and improvements that companies have undertaken can vary. To prevent customers from paying twice for growth, we adjusted all companies' allowances (except for Hafren Dyfrdwy) by calculating where historical funding was or will not be used in the period 2015–2025 to accommodate growth.

Stakeholders' representations

Companies agree with the principle of modelling growth at sewage treatment works separately from base enhancement costs. Some companies also explicitly agree that we should make adjustments for permit compliance and past delivery to protect customers from paying twice for improvements.

Model and cost drivers – Several companies commented on the model itself and the chosen drivers. Severn Trent Water stated that log models better fit the data and suggested the use of Weighted Least Squares estimators. Both Severn Trent Water and United Utilities stated that the short-term nature of the expected population equivalent growth scale driver was at odds with companies longer term view of growth improvements and the associated cost data. Severn Trent, United Utilities, and Wessex Water also suggested alternative drivers to reflect alternative complexity thresholds, account for additional costs from FFT/DWF ratio restoration, or directly capture headroom at a site.

Outliers – Severn Trent Water stated that log models can better identify low-cost outliers, while Wessex Water stated that additional iterations of outlier removal would better identify schemes suitable for a deep-dive assessment. Thames Water and Southern Water further disputed our decision to exclude specific schemes due to overlap with base costs.

Past under-delivery adjustment – Most companies commented on our post-modelling adjustments, particularly to account for past under-delivery. Yorkshire Water, United Utilities, and South West Water argued against elements of the adjustment in principle, pointing out the inherent uncertainty in growth materialising, the freedom of companies to allocate resources to most efficiently respond to incentives, or that under-spending may be due to factors outside of companies' control, such as the pace of property developments.

Other companies approved of the adjustment in principle, while some argued that comparing spending to company requests was inappropriate. Anglian Water, Wessex Water, United Utilities, and Yorkshire Water argued that implicit allowances for growth at sewage treatment works in the past were significantly different from company requests and is the correct benchmark against which to compare spending.

Oxford sewage treatment works – In terms of other stakeholders, Oxwed LLP, landowner of Oxpen development site in Oxford, states that it is very concerned to read that Ofwat is seemingly refusing to support some £5.1bn expenditure by Thames Water in PR24 and that this could delay vital upgrade to Oxford STW, compounding the existing delays [to new housing and commercial space] and leading to continuing pollution of the rivers.

Oxford University & Colleges Group (Oxford Growth Group) controls land allocated to commercial and residential development in Oxford and surrounding areas. It states that in order to put in place a Price Review that is consistent with commitments on growth, the upgrade to Oxford STW should be an essential and noted element of the Major Projects for the period. It also states that any shortfall in implementing the package of measures at Oxford STW, and across the catchment area, risks delay in delivering much needed planned development around Oxford, which has been identified by the relevant local planning authorities as being necessary to meet the need for homes and the provision of new jobs for the area.

Our assessment and reasons

Model and cost drivers – We agree with Severn Trent Water's comments on both the benefits of a log specification, particularly for outlier removal, as well as the issues with the short-term nature of the expected PE growth scale driver. Through our testing, we notice a significant difference between the two models using each scale driver, as well as the fact that the, in theory, more exogenous PE growth scale driver has changed significantly for certain companies in through draft determination responses. We therefore remove the model using expected PE growth as a scale driver and incorporate an additional model using process capacity added in a log-log specification.

Regarding other suggested model changes, our testing finds little-to-no improvements from alternative dummy thresholds or additional dummies suggested by companies, and so we do not include in our benchmark models. We disagree also with including additional variables to reflect FFT changes, as the DWF change driver in our model is highly related to increases in FFT permits.

Outliers – We have reclassified each growth at sewage treatment works scheme to assess its inclusion for an allowance in the growth line. This includes re-inclusion of schemes previously excluded in error. We disagree with the principle of additional rounds of outlier removal.

Past under-delivery adjustment – The adjustment for past under-delivery is important to prevent customers from paying twice for improvements. Our analysis shows that all but one company have spent less than their growth at STWs business plan requested costs over the 2015–25 period, with Anglian Water and Yorkshire Water spending less than half of their requests.¹⁵⁹ We therefore maintain the past under-delivery adjustment implemented at draft determinations where we calculate the difference between company requests and spending from PR14 and PR19 and adjust for cost sharing rates. We accept and acknowledge many of the arguments made by companies, but there are implementation difficulties to separately identify implicit allowances for growth at STWs in PR14 and PR19 as growth at sewage treatment works was not a separate line. We therefore reduce the past under-delivery adjustments by 50% to account for this and the other factors identified.

Oxford STW is a complex PR19 carryover WINEP scheme that has not yet been delivered. We discuss Oxford STW and the impact of growth in further detail in section 3.11.2 under ‘Thames WINEP AMP7’.

Our final determination

For final determination, we triangulate between two scheme-level econometric models to assess efficient costs, one using levels data and the other using a logarithmic transformation. Both models include the same cost drivers:

- expected process capacity added to address current and expected quality permits,
- expected change in Dry Weather Flow permit,
- dummy variable if sewage treatment works is decreasing and will be below 3mg/l, due to the engineering step change in process intensity to maintain compliance

We exclude several submitted schemes for being ineligible for growth at STWs allowances, for example, for having no AMP8 expenditure or no forecast population growth. We assess each scheme for overlap with base costs, including the disputed schemes raised by Southern

¹⁵⁹ We note also that industry efficiency challenges were small at PR14 ([PR14 wholesale cost assessment](#)) and PR19 ([PR19 final determinations cost efficiency technical appendix](#), p. 167), with companies largely receiving their requests on wastewater and base total expenditure.

Water and Thames Water. We note that a significantly higher proportion of schemes are non-compliant with DWF permits, applying the proposed 3-in-5 year rule to 2023 data.

We determine deep-dive allowances for 13 schemes that are identified as statistical outliers or are otherwise inherently difficult to model, such as a new South West Water scheme.

To protect customers from paying twice for growth improvements, we implement a past under-delivery adjustment to reflect that companies generally do not appear to have delivered the forecast capacity increases at sewage treatment works in the 2015-25 period. The calculated difference between requests and actual spending is adjusted both for cost-sharing as well as a 50% cut to reflect some of the practical difficulties, such as uncertain growth, external constraints, and differences between past requests and implicit allowances for growth.

We are concerned about overlap with base expenditure due to DWF non-compliance at growth sites. Through the PR24 query process, not all companies were able to provide satisfactory assurance that costs for remediating non-compliance were excluded from growth at STWs submissions. We therefore implement an additional adjustment for those companies, calculating the implicit proportion of the scheme that could be attributed to regaining compliance based on an approach proposed by Severn Trent Water¹⁶⁰. We also make adjustments where companies are requesting expenditure and the DWF permit does not change or does not change sufficiently for additional expenditure to be required above the expectations from base expenditure.

Our final determination allows £1.8 billion of growth at sewage treatment works costs on an AMP8 request of £2.4 billion, representing a 25% efficiency challenge. This compares to a £1.4 billion allowance on a £1.6 billion request at draft determinations, a 12% efficiency challenge. Both a higher past-delivery adjustment and an additional adjustment for compliance overlap with base contribute to the higher overall efficiency challenge. This allowance is also significantly higher than the requests for growth at sewage treatment works in PR14 (£659 million in 22-23 prices) and PR19 (£1.2 billion in 22-23 prices).

Table 31: Total growth at STWs allowances (£ million, 2022-23 prices)

Company	Final Allowance
Anglian Water	280.17
Dŵr Cymru	87.00

¹⁶⁰ Severn Trent subsequently reduced its request to account for the overlap with DWF compliance. We have not adjusted their request for this adjustment but made our own post modelling adjustment, which makes a similar scale adjustment.

Hafren Dyfrdwy	0.88
Northumbrian Water	38.19
Severn Trent Water	701.61
South West Water	21.34
Southern Water	228.57
Thames Water	182.54
United Utilities	99.58
Wessex Water	121.98
Yorkshire Water	24.65
Total	1786.51

For more detail of our approach, please refer to 'PR24 draft determinations: Expenditure allowances – Enhancement cost modelling appendix'.

3.10 Net zero

We introduced the net zero challenge in the PR24 methodology to encourage the delivery of net zero in the water sector, drive the innovation needed to achieve this and help reveal more reliable emission abatement unit costs. The approach should encourage the most efficient companies to reduce emissions faster in the short term, while not requiring the same of all companies who might not be able to achieve reductions at the same low cost¹⁶¹.

We encouraged all companies to propose schemes for the net zero challenge, including schemes that may not be optimal at a company level but are good value from an industry viewpoint. Eleven companies proposed schemes to the net zero challenge (SES Water, Northumbrian Water, Portsmouth Water, South West Water, Southern Water did not submit schemes).

What we said in our draft determinations

At draft determinations we allowed expenditure for 13 wastewater projects across four companies, totalling £316 million, and one nature-based catchment project totalling £1 million. No water only schemes were approved for funding.¹⁶² We stated that this funding would allow a better understanding of emissions and the impact of emission reductions

¹⁶¹ Ofwat, 'Creating tomorrow, together: our final methodology for PR24,' December 2022, 85–86.

¹⁶² Ofwat [Expenditure Allowances](#), July 2024.

technologies to emerge, particularly on process emissions. We put in place price control deliverables to support the delivery of key outputs and outcomes.

We also decided to allow an additional base expenditure allowance uplift of around £60 million to enable companies to invest in the infrastructure needed to adopt low carbon technologies critical to the reduction of emissions from the use of vehicles and heating.

Stakeholders' representations

We received 12 representations, ten from companies, one from an industry stakeholder, and one from an environmental group.¹⁶³ The representations included new information and explanation by companies that warranted a new review of 66 resubmitted schemes. Companies challenged our assessment on technologies such as real time control, process optimisation, monitoring, vacuum degassing, in-series digesters, cellulose recovery, ozone feeds, network control systems and heat recovery. We also received a representation from an industry stakeholder presenting views on the approach we took and the interpretation of the Net Zero Technology Review.¹⁶⁴ Further details on specific areas of feedback, and their impact on our assessment and reasoning, are detailed in the section below.

Our assessment and reasons

In the PR24 methodology we set out that net zero enhancement funding was to be focused on those companies that stretched themselves from base expenditure and had more mature and efficient approaches to emission reductions. We stated that eligibility for net zero funding would be limited to schemes that were primarily focused on reducing emissions and were supported by robust monitoring so the impact of schemes could be clearly demonstrated. To help identify best value schemes from an industry perspective, where feasible, proposed schemes should go beyond what may be optimal at a company level. Where appropriate we would allow funding for schemes based on the efficient unit cost.

The process for determining allowable net zero challenge funding for enhancement at final determinations followed the same process as for draft determinations. In the draft determinations we outlined our process following a three-phase methodology.¹⁶⁵ Phase 1 considered schemes eligible if driven by net zero and were not related to other cost drivers. Phase 2 focused on assessing the ability of schemes to support sector innovation and learning, with impact needing to be demonstrated through a programme of monitoring and reporting. Phase 3 focused on comparing unit rates of emission abatement. At draft determinations we noted a wide range of unit costs for abatement of carbon dioxide emissions and the small number of schemes which passed phase 1 and 2, which led to the

¹⁶³ Affinity Water, Anglian Water, Hafren Dyfrdwy, Severn Trent Water, South East Water, Thames Water, United Utilities, Welsh Water, Wessex Water, Yorkshire Water, Jacobs and The Wildlife Trust for Lancashire, Manchester and North Merseyside.

¹⁶⁴ Ofwat, 'Net Zero Technology Review', August 2022

¹⁶⁵ Ofwat, [Expenditure Allowances](#), July 2024.

decision to set a high limit for unit cost of emissions abatement, allowing all schemes which passed phases 1 and 2.

We completed a unit cost benchmark assessment for final determinations to review the efficiency of costs between companies. We have decided that the phase 3 unit cost benchmark assessment will not be applied to our final determinations. This is so we can allow a range of schemes and technologies to progress across more companies, some of which would not have been allowed had a unit cost benchmark been applied. This will create the greatest potential for learning across the sector, especially with regard to real time control schemes.

In re-applying our methodology with additional information and evidence we have changed our determinations for some technologies. We are allowing all schemes which have passed phase 1 and 2 of our methodology to support sector learning but with price control deliverables for each company.

Real time control

Six companies made representations in three key areas as they related to our decision on real time control schemes for nitrous oxide reduction.¹⁶⁶ Firstly, companies stated that such schemes were not business-as-usual as it is not undertaken in the delivery of core activities, with such schemes having not been delivered at scale. Secondly, companies evidenced that the optimisation of assets using real time control is focused on optimising the reduction of nitrous oxides, with wider performance and operational cost benefit being neutral or negative. Additional companies evidenced that the level of innovation inherent in the technology is much greater than appreciated in the assessments at draft determination, principally due to the level of integration of digital technology and learning expected in deployment.

Consequently, we have determined to allow funding for real time control schemes. Proposals for these schemes appear to present an effective means to reduce nitrous oxide emissions and maybe critical for informing investment decisions for future abatement of nitrous oxide emissions. These schemes also have the potential to provide useful data and demonstrate innovation.

Application of the Industrial Emissions Directive (IED)

Severn Trent Water and Yorkshire Water made representations relating to schemes for the reduction of methane emissions from wastewater.¹⁶⁷ On vacuum degassing, both companies asserted that the location of the equipment to be deployed is outside of the scope of the Industrial Emissions Directive, which applies to digester roofs and sludge tanks to capture off-gas. However, differing views were forwarded on our assessment of in-series digesters.

¹⁶⁶ Anglian Water, Severn Trent Water, United Utilities, Welsh Water, Wessex Water, and Yorkshire Water.

¹⁶⁸ Ofwat, [Green Recovery final decisions](#), July 2021.

Severn Trent Water stated that the in-series digester was complementary to the vacuum degassing, increasing the available biomethane in the sludge for recovery. Yorkshire Water accepted our assessment on in-series digesters, allocating the scheme to base expenditure.

At draft determinations we anticipated a commercial benefit to capturing more biomethane to displace fossil gas consumption and asserted that, in tandem with the IED, drivers other than net zero were driving these schemes. Representations on vacuum degassing and a review of the evidence provided suggest the commercial benefit is negligible, removing this as a driver for the schemes. Vacuum degassing is listed in our Net Zero Technology Review and presents an appropriate level of innovation.

For final determinations we have allowed funding for vacuum degassing as we accept that vacuum degassing will remove methane and that it is not included in the scope of the Industrial Emissions Directive.

We have not changed our position on in-series digesters. We still consider that there are operational benefits to operating digesters, such as reducing redundancy, improving effluent quality, and a reduction in heat, and therefore energy demand. As a result, we have determined net zero is not the primary driver for this technology.

Peatland and woodland

United Utilities and Dŵr Cymru stated that woodland creation and peatland restoration schemes are driven by net zero and involve new enhancements to their land holdings that will be delivered in partnership. Dŵr Cymru highlighted that there is a non-statutory driver in the NEP for net zero. As this driver is non-statutory, we have assessed Welsh Water's peatland and woodland schemes against the same criteria as United Utilities.

United Utilities and Dŵr Cymru provided evidence that their peatland restoration schemes meet the criteria for insets under the Performance Commitment definition. The proposals are also consistent with our decisions on the Green Recovery, our net zero principles, and are linked to the delivery of water and wastewater services. We have therefore decided to allow funding for peatland restoration.¹⁶⁸ However, we continue to consider that woodland creation is not eligible for funding at this time as it does not meet the criteria for insets under the Performance Commitment definition.

Decarbonised heat and transport

Seven companies provided representations on schemes for low-carbon heating and low-carbon transport, such as transitioning fleets to electric vehicles.¹⁶⁹ In general companies

¹⁶⁸ Ofwat, [Green Recovery final decisions](#), July 2021.

¹⁶⁹ The seven companies are Affinity Water, Hafren Dyfrdwy, Severn Trent Water, South East Water, Thames Water, United Utilities and Wessex Water.

considered that fleet transition is an enhancement activity because it includes additional costs above like-for-like vehicle replacement and requested additional funding for these costs. Wessex Water resubmitted its heat recovery scheme, which would use effluent heat recovery to run a heat pump supplying heat to anaerobic digesters.

We continue to consider that transport and heating are not enhancement activities. However, we recognise that the transition to net zero in these areas involves additional costs due to the investment needed in enabling infrastructure such as electric vehicle charging points and heat pumps. As a result, we are providing an additional allowance related to these costs through the sector-wide net zero base cost adjustment.

Cellulose recovery

Severn Trent Water provided a representation on its proposed cellulose recovery scheme. The company stated that the purpose of the scheme has changed since draft determinations from the combustion of cellulose in place of fossil gas, to a circular economy initiative which anticipates the use of collected cellulose in other industries and improving the quality of the sludge. Despite this change of purpose, we have decided not to allocate funding as the scheme is driven by circular economy ambitions, with difficult to quantify and indirect net zero benefits for Severn Trent Water. The scheme is striving to reduce emissions by using the cellulose as feedstock in other sectors for which any emissions reductions would be gained by those sectors.

Network control system

Dŵr Cymru detailed that its Network Control System was driven by Natural Resources Wales and the National Environment Programme (NEP) with the anticipated benefit of reducing greenhouse gas emissions. However, we have decided not to allocate funding as the scheme does not demonstrate sufficient innovation and the technology does not provide sufficient confidence that it will deliver emissions reductions.

Ozone upgrades

South East Water proposed the driver for two ozone upgrade schemes was to reduce greenhouse gas emissions, which would be achieved through changing the ozone feed from gas to liquid which represents an enhancement of the existing asset. Although the scheme is not for the cost of ozone replacement, we have decided not to allocate funding as the schemes are not clearly driven by net zero as South East Water anticipate considerable energy demand reductions, which is a commercial driver.

Our final determination

Based on our assessment, we are allowing expenditure for 33 schemes across seven companies, totalling £501.4 million. Within this we are allowing for £34 million for peatland

restoration schemes and £1 million for one nature-based catchment project. The majority of the net zero challenge allowance is for wastewater enhancement schemes, totalling £467 million.

We are putting in place price control deliverables (PCDs) to drive the delivery of key outputs and outcomes, and to ensure learning is shared. These require companies to report on the emission reductions from schemes, using real time data to demonstrate impact. When reporting on the emission outcomes of schemes in the context of the operational GHG emission PCLs, companies must report using the Carbon Accounting Workbook v17 (as detailed in the respective performance commitment definitions). To support the sector to address concerns around reporting of process emissions, companies will also be permitted to dual report using their own data such that they demonstrate the potential wider impact of their schemes on their total organisational GHG emissions. If companies choose to dual report, they are required to be clear on the methodology employed. Company designed dual reporting will not be taken into account when determining performance against the company's performance commitment level.

We expect net zero challenge funding to enable greenhouse gas emissions reductions at efficient cost for customers and allow wastewater companies to acquire a better understanding of emissions and the impact of emissions reductions technologies as they emerge. Where possible, it is expected companies will accelerate delivery so to enable learning at the earliest opportunity and to aid decision-making for the next price review. This should also support overall emissions reductions in the short term.

Table 32: Summary of net zero challenge funding allocations

Company	Allowance (£m)	Number of sites	Intervention (& number of sites)
Anglian Water	75.5	18	Nitrous oxide containment (3), Membrane Aerated Biofilm Reactors, enhanced aeration and real-time control (3), Membrane Aerated Biofilm Reactors and Digital Twin for Real Time Control and optimisation (2), liquor recovery (1), Real Time Control (9)
Dŵr Cymru	49.05	21	Reduction of process emissions by Real Time Control (20), Peatland restoration (1)
Hafren Dyfrdwy	0.86	1	Digital Twin in combination with nitrous oxide containment (1)

Company	Allowance (£m)	Number of sites	Intervention (& number of sites)
Severn Trent Water	294.94	191	Nitrous oxide containment and treatment (23), Membrane Aerated Biofilm Reactors (13), Digital Twin in conjunction with activated sludge plant processes (32), Real Time Control for process optimisation (105), Vacuum degassing (18)
United Utilities	55.62	18	Process emissions Real Time Control (17), Peatland restoration (1)
Wessex Water	2.22	20	Reduction of process emissions by Real Time Control (20), Peatland restoration (1)
Yorkshire Water	23.21	22	Nitrous oxide reduction using Real Time Control (13), Vacuum degassing (9 sites)

3.11 Thames Water – Freeform and additional requests

3.11.1 Thames Water gated allowances

What we said in our draft determinations

In its original business plan, Thames Water proposed a range of additional expenditure, totalling over £2 billion (22/23 prices) to address what the company termed its 'asset deficit'. Thames Water's terminology did not correctly characterise the nature of the work for which Thames Water sought funding. A large part of the work it proposed was to improve assets.¹⁷⁰

In our draft determination we rejected all claims in full. We set out that base expenditure is for companies to deliver resilient services on a day-to-day basis, and it is Thames Water's duty to manage the risk related to continuity of service to enable the maintenance of assets. While some parts of Thames Water's network are likely to require improvement, Thames Water's proposals and estimates did not provide a reliable basis on which to provide additional allowances, due to insufficient evidence of need. The expenditure did not appear to have been subject to sufficient feasibility assessment or investigation and costs were insufficiently robust for inclusion in allowances at draft determination.

¹⁷⁰ Further details of our assessment of Thames Water's 'asset deficit' is set out in Ofwat, [PR24 draft determination: Expenditure allowances – Thames Water asset improvement gated allowance appendix](#), July 2024, page 4f

However, the scale and scope of our concerns with Thames Water's proposals meant it was unlikely that Thames Water will be able to address them fully in response to the draft determinations.

Given the potential impact of poor asset health and asset health management on company performance, we considered it was not in the best interests of customers and the environment to wait another five years for Thames Water to provide better evidence, and a proposal to improve asset performance. This would mean progress would not begin until 2030, at the earliest.

In our draft determination we therefore proposed to provide Thames Water with an asset improvement gated allowance. The gated allowance would give Thames Water additional customer funding of no more than £1 billion, allocated at £500 million for water and £500 million for wastewater, to improve the performance of Thames Water's assets and improve service to customers and the environment. This investment is to be subject to substantially more in period scrutiny to expenditure than we would normally apply through a series of gates. This would assist the company to address issues in the 2025–30 period, protecting customers' interests and promoting long term asset health. We required Thames Water to support any of its gated submissions with independent third-party assurance, to demonstrate that Thames Water has delivered an agreed set of work to Ofwat's satisfaction.

Stakeholders' representations

In its representation, Thames Water welcomes this proposed allowance and acknowledged the concerns we raised with respect to its initial business plan submission. Thames Water intends to secure asset health improvement funding for the following asset groups (but notes that the balance of investment across these cohorts may change as prioritisation and confidence in solution costs improves over time and gates are passed):

- Water treatment works and pumping stations
- Water service reservoirs and water towers
- Trunk mains
- Water and Wastewater operational technology
- Gravity Sewers
- Wastewater critical assets
- Rising mains
- Wastewater operational technology

To support its representation Thames Water has submitted an initial Gate 0 submission for rising mains and has provisionally proposed seven further Gate 0 submissions from November 2024 to February 2025.

In addition, Thames Water requests engagement on the proposed gated process, with respect to some further clarity over gate details, assurance and timings. The company has

also included additional freeform enhancement requests for its Wastewater Asset Assurance Programme (WAAP) and a carryover of the existing London Water Infrastructure Conditional Allowance (LWICA) into the 2025–30 period.

Our assessment and reasons

We have considered the points raised by Thames Water in its representation and we set this out in greater detail in 'PR24 final determinations: Expenditure allowances – Thames Water asset improvement gated allowance appendix'. We have developed our gated process building on the approach used both for the London resilience and London Water Network Conditional gated allowances in PR19, with the introduction of a new Gate 0.

We have adjusted our indicative timescales in part to reflect the concerns raised by the company, but it will be for Thames Water to deliver the schemes as quickly as possible. We still require the use of Ofwat gates, and the gates provide sufficient clarity of high-level deliverables and Thames Water will need to provide further details relevant to the specific expenditure areas.

In the draft determination we requested Thames Water to provide several Gate 0 submissions with its representation with a view to passing a tranche of investment through to Gate 1 for final determination. We have however only been able to assess a single Gate 0 submission, for rising mains, due to others not being issued by the company. The rising main Gate 0 submission has been subsequently revised and is due to be resubmitted but has not, as of yet, been passed through to Gate 1.

Our final determination

For final determination, we have allocated the allowance £500 million for water and £500 million for wastewater. This customer funding is for Thames Water to improve the performance on its water and wastewater assets beyond its historical levels. We are also including an additional gated allowance of £250 million for growth at STWs and an additional gated allowance of £49.2 million to complete the distribution and trunk mains projects outstanding under the London Water Infrastructure Conditional Allowance (LWICA). These additional allowances will follow the same rigorous gating process. The funding will be accessed through a rigorous gating process for each individual workstream as set out in 'PR24 final determinations: Expenditure allowances – Thames Water asset improvement gated allowance appendix'.

Further information on Thames Water's two gated schemes from PR19 – the water supply system resilience programme (WSSRP) and the LWICA (including the carryover into AMP8 and the mechanisms in place to protect customers) – can be found in: 'PR24 final determinations: Accounting for past delivery' and the 'PR24 final determinations: Major Projects development and delivery' appendix.

The asset improvement allowance is intended to deliver clear and tangible benefits to asset health, where Thames Water presents a specific risk that the investment is addressing, and the output is clearly defined. The growth at STW allowance is intended to deliver enhancements to support a step-change in growth and the LWICA allowance is to enable the completion of the existing trunk main and distribution main schemes.

We expect Thames Water's gated process proposals to be subject to independent assurance, including any proposed changes. To date, Thames Water has not appointed an independent third-party assurer with a duty of care to Ofwat. This will need to be addressed before any future submissions will be passed through to Gate 1. Further details of our expectations as to what constitutes effective assurance are provided in 'PR24 final determinations: Expenditure allowances - Assurance requirements for delivery of enhancement schemes'.

3.11.2 Thames WINEP AMP7

What we said in our draft determinations

At draft determination, Thames Water submitted an enhancement business case for £1,134 million to deliver its outstanding PR19 AMP7 WINEP actions. The requested cost was to cover growth and increased cost pressures across the entire AMP7 WINEP programme, which it stated could not be completed before the end of AMP7 with the allowance it was given at PR19. Part of the company's PR19 WINEP programme was funded through two uncertainty mechanisms as, at the time of the final determination, the Environment Agency was not able to confirm the schemes that needed to be delivered. Our decision at draft determination was to allow the company a PR24 expenditure allowance of £363 million to deliver the outstanding AMP7 actions. This was either PR19 expenditure that had been clawed back through the PR19 uncertainty mechanism or had not been included in PR19 final determination allowances. We rejected the remaining requested allowance based on insufficient and unconvincing evidence that the company faced different cost pressures to other companies; that costs were not covered by base expenditure or were under management control; or that our PR19 models did not treat it differently to other companies.

Stakeholders' representations

In its draft determination representation, Thames Water increases its requested expenditure to £1,181 million across the water and wastewater freeform lines. It provides some additional evidence for the increased cost pressures it considers it is facing in delivering the outstanding PR19 WINEP actions, particularly at six sewage treatment works including Oxford STW. A late query response from the company revised its original growth request by an additional £59.3 million.

Oxwed LLP, landowner of Oxpen development site in Oxford, states that it is very concerned to read that Ofwat is seemingly refusing to support some £5.1bn expenditure by Thames Water

in PR24 and that this could delay vital upgrade to Oxford STW, compounding the existing delays [to new housing and commercial space] and leading to continuing pollution of the rivers.

Oxford University & Colleges Group (Oxford Growth Group) controls land allocated to commercial and residential development in Oxford and surrounding areas. It states that in order to put in place a Price Review that is consistent with commitments on growth, the upgrade to Oxford STW should be an essential and noted element of the Major Projects for the period. It also states that any shortfall in implementing the package of measures at Oxford STW, and across the catchment area, risks delay in delivering much needed planned development around Oxford, which has been identified by the relevant local planning authorities as being necessary to meet the need for homes and the provision of new jobs for the area.

Our assessment and reasons

We have reassessed Thames Water's claim for additional allowances to complete its AMP7 WINEP programme and the additional evidence provided by the company. We provide additional allowances for the following:

- Growth – we agree with the company that population growth and changes in design population equivalents are driving increased costs across a number of sewage treatment works. We also allow for the additional phosphorus removal costs resulting from growth. However, we do not make an allowance for the late, additional increased allowance for growth as part of this request.
- Flow to full treatment and storm tank storage – we allow additional costs for the scope not included in the PR19 cost estimates.
- Oxford STW – Given the increased scale of the scheme due to growth requirement, we assess Oxford STW as a complex, outlier scheme for growth and deep dive the additional evidence provided on the increased cost pressures, making an allowance for elements of the scheme not previously made or not covered under other enhancement areas.

We do not make allowances for parts of the company's WINEP AMP7 enhancement request that are not supported by sufficient or convincing evidence, such as the water WINEP AMP7 actions. We do not make allowances for expenditure related to capital maintenance or inflation above CPIH as these are covered by base expenditure and would not have occurred had the company delivered the schemes on time.

Our final determination

Following our deep dive assessment of the company's enhancement case, we are making an allowance of £587.2 million. In addition, we are making an allowance of £419.4 million which is the PR19 expenditure that had been clawed back through the PR19 uncertainty mechanism or had not been included in PR19 final determination allowance.

These allowances provide sufficient funding for Thames Water to deliver Oxford STW, Maple Lodge STW and other outstanding AMP7 schemes in full. We remain concerned with the delay in the completion of these schemes, and as such Thames Water should not delay implementation further.

4. Cross cutting cost assessment issues

In this section we set out detail on the following elements of our cost assessment approach that cut across base and enhancement expenditure:

- frontier shift efficiency and real price effects;
- improving performance with cost allowances;
- catchment and nature based solutions;
- transition expenditure programme and accelerated infrastructure delivery project;
- our approach to splitting totex allowances into opex and capex;
- separate price controls for major projects;
- dealing with uncertainty; and
- monitoring delivery.

4.1 Frontier shift efficiency and real price effects

Water companies do not face competitive market pressures in most services they provide. We therefore set efficient base cost allowances so that customers do not pay for inefficiency.

Frontier shift (or 'ongoing efficiency') is the rate of efficiency improvements that even the most efficient companies in the industry can achieve, from improvements in working practices and the introduction of new technology. It is intended to replicate the forces of competition which would incentivise companies to continually drive out efficiencies over time by reducing costs. Frontier shift efficiency improvements are in addition to any catch-up efficiency challenge discussed in sections 2 and 3.

We also assess the need for any real price effects (RPEs) over the forthcoming control period. RPEs relate to input prices faced by water companies increasing or decreasing in real terms relative to general consumer price inflation (CPIH). Positive RPEs increase costs in the next control period, while negative RPEs reduce costs.

For final determinations, we apply a:

- **Frontier shift efficiency adjustment of 1% per year.**
- **Labour cost RPE for wholesale labour costs** and an ex-post true-up between forecast and outturn wage growth using the ONS manufacturing wage index for base costs and the ONS construction wage index for enhancement costs.
- **Labour cost RPE for retail labour costs.** – with no associated ex-post true up.

- **Energy cost adjustment to base expenditure allowances** that incorporates a forecast for delivered energy prices which gradually reduces over the period; and an ex-post energy cost true-up and an ex-post energy cost true-up between forecast and outturn energy prices using the Department for Energy Security and Net Zero (DESNZ) energy price index for large industrial users.
- **Ex-post true-up for materials, plant and equipment enhancement expenditure** between CPIH and infrastructure construction output prices published by the ONS.

We apply our frontier shift efficiency and RPE assumptions from 2024-25 onwards– the first year of forecasts used in our cost assessment for final determinations. This is updated from draft determinations where we applied frontier shift and RPEs from 2023-24. This is because 2023-24 outturn information has been incorporated into our cost assessment.

We apply frontier shift and RPEs to all expenditure allowances, except for costs that are mostly outside of company control such as business rates and abstraction charges, and self-financing costs such as third-party services and diversions costs. Our cost assessment has been conducted using business plan forecasts before the application of frontier shift efficiency and RPEs to avoid double counting.

The sections below summarise our draft determinations proposal and explain how we have reached our frontier shift and RPEs decisions for final determinations.

CEPA and Europe Economics provided independent advice on frontier shift and RPEs for draft and final determinations. Our proposals align with CEPA's and Europe Economics' advice and recommendations.

4.1.1 Frontier shift efficiency

What we said in our draft determinations

We applied a frontier shift efficiency adjustment of 1% per year. This was in the middle of CEPA's recommended frontier shift efficiency range of 0.8% to 1.2%.

We used analysis of historical Total Factor Productivity (TFP) growth in comparable industries outside the water sector to set the frontier efficiency challenge. TFP growth captures the change in the volume of outputs produced per volume of inputs (ie growth in output not attributable to changes in capital or labour inputs) and provides a proxy for the rate of technological progress.

We did not use the water sector itself to avoid creating a perverse incentive for the water companies to influence the frontier shift efficiency challenge at future price reviews and so that frontier shift efficiency assumptions were based on competitive sectors.

We used the EU KLEMS database to assess frontier shift in comparator sectors as it provides data broken down into 40 industries and a long-run time-series of data from 1995 to 2023.¹⁷¹

CEPA found no evidence to suggest the scope for frontier shift during PR24 was substantially different from that which other UK regulators have set in recent decisions, which cluster around 1%. For example, Ofgem applied a 1% per year frontier shift efficiency challenge in RIIO-ED2, which was determined in late 2022.

A 1% per year frontier shift efficiency challenge was also aligned with the frontier shift efficiency challenge applied by South Staffs Water, Portsmouth Water and SES Water in PR24 business plans.

Europe Economics considered the forward-looking outlook for productivity across the economy and in the water sector for us.¹⁷² It found the reasons suggested in the academic literature for low economy-wide productivity growth since the 2007-08 financial crisis do not apply to the water sector. And the slow growth in economy-wide labour productivity over 2023-25 forecast by the Bank of England is driven by factors relating to Brexit, Covid-19 and the energy price shock that do not directly apply to the water sector.

There were also reasons to expect that economy-wide productivity growth would accelerate going forward due to monetary tightening forcing the exit of the most inefficient firms, freeing up inputs for more productive use; and wider use of artificial intelligence, big data and robotics in the water sector and economy as a whole. This was reflected in the Office for Budget Responsibility's (OBR's) long term forecast of labour productivity of between 1% and 1.5% per year.¹⁷³

We considered overall that evidence may have supported a more stretching challenge of up to 1.2% per annum:

- EU KLEMS TFP analysis does not account for cost savings that water companies make through embodied technical shift (an increase in the quality of inputs – eg new information and communications technology (ICT)).
- Artificial intelligence (AI) has now reached a stage of development at which it can be widely applied across the economy, raising the potential for an AI driven acceleration in productivity growth over the coming years in wholesale and retail services.¹⁷⁴

¹⁷¹ EU KLEMS total factor productivity data is available back to 1971 in the EU KLEMS November 2009 release (revised in March 2011). But there has been significant changes in the way ONS measures real gross domestic product (GDP) introduced in 2021. This means it is not possible to reconcile the 2023 EU KLEMS dataset with the EU KLEMS dataset that goes back to 1971.

¹⁷² Europe Economics, 'Frontier Economics and Outcomes Stretch at PR24', March 2023, pp3, 17-30.

¹⁷³ Office for Budget Responsibility, '[Supplementary forecast information release: Long-term economic determinants – March 2023](#)'.

¹⁷⁴ Europe Economics, 'Critique of Economic Insight reports on productivity and frontier shift at PR24', 2024.

- Recent innovation fund winners show potential productivity gains in the water sector through better use of big data and robotics.¹⁷⁵
- Water and wastewater companies will deliver a step-change in enhancement investment over the 2025–26 to 2029–30 period, which should facilitate a 'learning by doing' productivity effect as companies find better ways of working to deliver the increase in workload.¹⁷⁶

In-the-round, we decided to set a more conservative frontier shift efficiency challenge of 1% per year for draft determinations, and welcomed views from stakeholders on whether we should apply a stretching challenge at final determinations.

Stakeholders' representations

We received a range of responses on frontier shift efficiency from water companies:

- Anglian Water, South West Water, Portsmouth Water, SES Water and South Staffs Water adopted our draft determination frontier shift efficiency proposal of 1% (or higher) per year.
- Northumbrian Water proposed a frontier shift efficiency challenge of 0.8% per year.
- Affinity Water, South East Water, Southern Water, Welsh Water, Wessex Water, Thames Water and United Utilities assumed a frontier shift efficiency challenge of around 0.5% per year.
- Severn Trent and Hafren Dyfrdwy are the only companies with specific comments on the frontier shift challenge for the retail price control. The companies consider that it would be inappropriate to apply the same PR19 comparator to the retail activities as wholesale. Most other companies proposed a frontier shift challenge of 0.45% to 1%.

Affinity Water, Anglian Water, South East Water, Southern Water, Yorkshire Water and Wessex Water referred to a frontier shift efficiency report prepared by Economic Insight on their behalf, which argues that frontier shift efficiency should be set at a substantially lower level than that proposed by Ofwat.¹⁷⁷ This follows two previous Economic Insight reports on the same topic.¹⁷⁸ Economic Insights' main arguments are as follows:

¹⁷⁵ Europe Economics, 'Frontier Shift and Outcomes Stretch at PR24', March 2023, pp.27–28.

¹⁷⁶ CEPA, 'Frontier shift, real price effects and the energy crisis cost adjustment claim mechanism', 2024.

¹⁷⁷ Economic Insight (August 2024) "The Importance of a Balanced Approach to Frontier Shift", available at anglianwater.co.uk.

¹⁷⁸ Economic Insight (April 2023) "Productivity and frontier shift at PR24" available at thameswater.co.uk; and Economic Insight (March 2024) "Further evidence on frontier shift at PR24" available at economic-insight.com.

On historical productivity for the water sector:

- Economic Insight argues that Ofwat's frontier shift assumptions at recent price controls have been higher than what the sector has achieved.
- It presents data from the EU KLEMS dataset which shows negative TFP growth in the 'Water supply; sewerage, waste management and remediation activities'¹⁷⁹ industry, and uses this to claim that the water industry has consistently experienced low productivity growth in line with broader UK trends.

On investment trends in the water sector:

- Economic Insight argues the water sector exhibits the same underinvestment trend as the UK economy more broadly. Economic Insight claims that water company capital expenditure per head of population declined between 1997 and 2022.

On technological progress in the water sector:

- Economic Insight argues the water industry is not 'high tech' because it contributes a very small proportion of UK spending on research and development (R&D) and employment in R&D.

On the relationship between TFP and 'catch up' efficiency:

- Economic Insight argues the TFP estimates derived from EU KLEMS also capture 'catch-up' efficiency gains in the comparator industries, thereby overstating the scope for frontier shift.

We also received comments on frontier shift efficiency around the following themes:

Inconsistencies between frontier shift and RPEs

- Anglian Water and Northumbrian Water argue that real wage growth and productivity growth are intrinsically linked. And therefore expect real wage growth to be similar to Ofwat's frontier shift efficiency assumption over the long-term.

Reduced flexibility to achieve cost reduction

- Affinity Water, South West Water, Dŵr Cymru, Northumbrian Water and United Utilities raise concerns that the introduction of Price Control Deliverables (PCDs) will reduce

¹⁷⁹ 'Water supply; sewerage, waste management and remediation activities' refers to an industry classification within the EU KLEMS dataset.

flexibility in managing capital delivery programmes, which may reduce opportunities to achieve efficiency gains.

Application of frontier shift to enhancement expenditure allowances

- South Staffs Water argues that frontier shift should not be applied to enhancement expenditure allowances because its business plan requested costs already include a total efficiency challenge.

Retail comparator set

- Severn Trent Water and Hafren Dyfrdwy argue it is inappropriate to apply the same comparator set to the wholesale and retail activities because the retail activities differ significantly in their factors of production.

Our assessment and reasons

We set out our assessment of stakeholder responses on frontier shift efficiency below, which is informed by CEPA¹⁸⁰ and Europe Economics¹⁸¹ independent assessment:

On historical productivity for the water sector

- Measuring TFP growth in the water sector is problematic because the ONS appears to measure output in the sector by the volume of water delivered, which is not a good measure of what the sector is achieving since most enhancement investment in the water sector is to improve environmental performance rather than increase water volumes. EU KLEMS uses data which are ultimately sourced from ONS, and hence EU KLEMS estimates for water sector TFP growth will also be affected by the problem. These measurement problems mean that the water sector TFP estimates presented by Economic Insight are not a reliable indicator of productivity growth in the water sector.
- Economic Insight omitted sectors from the analysis underpinning its June 2024 report that were included in our frontier shift efficiency analysis at PR19.¹⁸² This omission leads to a TFP growth estimate (0.04% to 0.21%) which is lower than what would have been obtained if they had been included (0.4% to 1.3%).
- Economic Insight did not engage in Europe Economics' arguments relating to opportunities for higher productivity growth in the 2025–30 period. Europe Economics consider the reversion of loose monetary policy that allowed inefficient firms to survive in

¹⁸⁰ CEPA, 'PR24 Final Determinations Frontier Shift, 2024.

¹⁸¹ Europe Economics, 'Response to Company Representations regarding Frontier Shift for PR24', 2024

¹⁸² Manufacturing of chemicals and chemical products; Manufacturing of machinery and equipment and Manufacturing of furniture; jewellery, musical instruments, toys; repair and installation of machinery and equipment.

the post-crisis period should lead to inefficient firms exiting the market, leading to productivity improvements.

On investment trends in the water sector:

- Europe Economics analysis does not support the hypothesis that the UK's sluggish productivity growth post-crisis is due to a negative investment trend. The trend in UK investment switches from being negative pre-crisis to positive post-crisis, and more steeply positive than for comparator countries.
- The water sector has not suffered from an underinvestment problem post-2008. Europe Economics finds that water sector investment growth has been faster than the UK economy as a whole pre- and post-crisis. And investment by water companies roughly doubled shortly after privatisation in 1989 and remained at that level all the way through to 2019-20, with a slightly positive trend from 1989-90 to 2019-20.
- We note that much of the investment that takes place in the water sector is determined by the Environment Agency and Drinking Water Inspectorate, and is forecast to increase significantly over the 2025-30 period.
- It is also worth highlighting that as Europe Economics notes, investment does not affect TFP growth at a theoretical level because TFP growth is the residual increase in output after accounting for changes in the quantity and quality of inputs such as capital.

On technological progress in the water sector:

- Water companies provided many examples of innovation projects in business plans on areas such as environmental monitoring, customer interactions and the reduction of future costs. This is at odds with Economic Insights' conclusion that there is little scope for innovation within the water sector.
- The water sector benefits from R&D carried out by other sectors when it purchases inputs (through embodied technical shift), and hence it is not just the R&D carried out by water companies that is relevant when setting frontier shift.

On the relationship between TFP and 'catch up' efficiency:

- Europe Economics states that productivity dispersion has increased since the financial crisis with the laggard firms falling further behind the efficiency frontier.
- As a result, the historical sectoral average TFP growth rates may underestimate productivity growth that has been achieved by frontier firms and future productivity growth.

Inconsistencies between frontier shift and RPEs:

- The purpose of the labour RPE is to produce the best forecast of real wage growth for the 2025–30 period based on external forecasts. There is no reason why productivity growth should equal wage growth over any 5-year period. This is illustrated by the increase in wage growth trends over the last 5-years.¹⁸³ We also note that labour is only one input a water company uses to achieve productivity improvements (i.e. we do not overlook the, non-labour inputs such as machinery, plant and equipment).
- We note the Office for Budget Responsibility's (OBR's) long term forecast of labour productivity of between 1% and 1.5% per year, which aligns with our frontier shift efficiency assumption at draft determinations.¹⁸⁴

Reduced flexibility to achieve efficiencies:

- PCDs hold companies to account for delivery of key outputs and outcomes. But companies retain flexibility and are incentivised to deliver these outputs and outcomes as efficiently as possible. It is important that customers do not pay for something they do not receive.
- The material increase in planned investment over the 2025–30 period creates an opportunity for learning by doing effects, which should increase productivity gains.

Application of frontier shift to enhancement expenditure allowances:

- We assessed enhancement expenditure assessment using business plan forecast data before the application of frontier shift efficiency and real price effects. We also utilised historical cost benchmarking analysis where possible. So, it is entirely appropriate to apply frontier shift to enhancement expenditure allowances.
- We note we applied frontier shift efficiency to enhancement areas that are more common across companies at PR19, including wastewater water industry national environment plan (WINEP) and metering costs. We concluded the potential gains from productivity improvements were likely to be more significant for large, relatively homogenous programme of work that are common across companies. And we found companies' frontier shift assumptions on enhancement expenditure tended to be limited.

¹⁸³ CEPA, 'PR24 Final Determinations Frontier Shift, 2024, page 34.

¹⁸⁴ Office for Budget Responsibility, '[Supplementary forecast information release: Long-term economic determinants – March 2023](#)'.

Retail comparator set:

- Severn Trent Water and Hafren Dyfrdwy's responses do not reflect the full range of evidence that CEPA considered in recommending a similar frontier shift range for both the retail and wholesale business.
- Overall, CEPA reached the view that there is no comparator or set of comparators which forms a perfect proxy for the retail activities delivered by the water companies. But it considered the PR19 wholesale comparator set was a reasonable starting position and cross-checked it against the PR19 retail comparator set (1.1%). CEPA concluded that the range of 0.8% to 1.2% remained appropriate.

Further assessment of stakeholder responses to Europe Economics work on frontier shift at draft determinations can be found in their final determinations report.¹⁸⁵

CEPA's recommended frontier shift efficiency range at PR24 final determinations:

CEPA recommend a frontier shift efficiency range of 0.8%–1.2% per year at final determinations across wholesale and retail price controls. It concludes that no stakeholder presented sufficient and convincing evidence to justify a change in its recommendation.

Our final determination

For PR24 final determinations, we continue to apply a frontier shift efficiency adjustment of 1% per year to wholesale and retail expenditure allowances. This is in the middle of CEPA's recommended frontier shift efficiency range of 0.8% to 1.2%. We do not consider any stakeholders have presented sufficient and convincing evidence to justify a different assumption at final determinations.

We retain our view that this represents a conservative frontier shift efficiency challenge due to the range of factors that could support a more stretching challenge of up to 1.2% per year (eg including embodied technical shift; AI driven acceleration in productivity growth in the coming years; better use of big data and robotics; and step-change in investment over the 2025–30 period, which should facilitate a 'learning by doing' productivity effect.

4.1.2 Real price effects – wholesale**What we said in our draft determinations**

Wholesale expenditure allowances are indexed to a general measure of inflation (CPIH). Water companies use a range of inputs – labour, energy, materials plant and equipment, chemicals,

¹⁸⁵ Europe Economics, 'Response to Company Representations regarding Frontier Shift for PR24', 2024

and 'other'. Some inputs exhibit underlying rates of cost inflation that are less well correlated with CPIH. We consider RPE allowances for the difference between CPIH and an independent price index (which is a better proxy for the change in costs of the relevant inputs) where these cost pressures are driven by external, macroeconomic or supply factors that the water companies cannot control.

At PR19, we provided an RPE uplift for wholesale labour costs in ex-ante allowances, with a true-up for the difference between forecast and outturn wage growth at the end of the 2020–21 to 2024–25 period. We concluded there was no need for an RPE uplift to ex-ante allowances or ex-post true-up for energy, chemicals and materials, plant and equipment based on the outcome of three tests developed by Europe Economics:

- Is the wedge between CPIH and the input price materially different from zero?
- Is it likely that CPIH does not adequately capture the input price?
- Is the input price, and exposure to movements in it, outside of management control?

For PR24, CEPA advised us on RPEs for draft determinations and applied the following criteria which it applied 'in the round' to assess the need for a RPE, which builds on the PR19 criteria:

- Is the cost category a material share of totex?
- Is the input cost something which the companies can largely control or mitigate?
- Is the input cost already captured in CPIH?
- Is the expected input cost pressure materially different from CPIH?
- Are there reliable independent forecasts of the relevant price index available?

Our draft determinations proposals were aligned with CEPA's recommendations and are summarized below.

Labour costs

We applied a labour cost RPE based on OBR's earnings forecasts. We also proposed to apply an ex-post true-up between forecast and outturn wage growth using the ONS ASHE manufacturing wage index for wholesale base labour costs, and the ONS ASHE construction wage index for wholesale enhancement labour costs. This approach is consistent with our PR19 approach, and reflects that labour costs are material and labour prices are largely outside of company control in the short term.

Energy costs

We applied CEPA's recommended energy cost adjustment to our wholesale base expenditure allowances. This incorporated an energy RPE based on CEPA's energy price forecasts. We proposed to introduce an ex-post true-up between forecast and outturn energy prices using the Department for Energy Security and Net Zero (DESNZ) energy price index for large industrial users to address uncertainty in future energy prices.

We did not apply an energy RPE to enhancement expenditure allowances due to the energy cost share being immaterial (around 4% of total forecast AMP8 enhancement expenditure).

Materials, plant and equipment costs

We did not include a materials, plant and equipment (MPE) RPE in ex-ante expenditure allowances. MPE costs are material (around 20% of base costs; over a third of enhancement costs). But historical input price inflation is not materially different from CPIH over the long term, and there are no reliable published independently forecasts of construction output prices. Companies also have some control over MPE costs as they typically enter long-term frameworks with suppliers that protect companies from price volatility.

For enhancement expenditure, we proposed to introduce an ex-post true-up for MPE costs between CPIH and new infrastructure construction output prices published by the ONS (COP1 indices).¹⁸⁶ The true-up would provide some protection to water companies if there is tightness in the infrastructure supply chain that would otherwise inhibit the delivery of the ambitious PR24 enhancement programme. We sought views from companies on our proposal, and whether the true-up should apply with a deadband so that it is only applied if the magnitude of the associated ex-post adjustment is above a certain threshold.

For base expenditure, we did not apply an ex-post true-up for MPE costs. ONS's repair and maintenance construction output price index is the most relevant index for base costs. But there is not a material wedge between this index and CPIH.

Chemical costs

We did not include a chemicals RPE in ex-ante cost allowances or introduce an ex-post true-up. Chemical costs represent an immaterial share of costs, and the ONS chemicals price index does not significantly deviate from CPIH. In addition, the ONS chemicals price index, which is the best available independent index, covers a wide range of chemicals so is not a good reflection of water company chemical costs.

Stakeholders' representations

Overall, we received relatively few stakeholder comments on our RPE proposals.

On labour costs, Anglian Water and Thames Water suggest there is new evidence that the labour RPE should be higher based on a collection of independent forecasts compiled by HM Treasury in May 2024.¹⁸⁷

¹⁸⁶ Office for National Statistics, Construction output price indices, available here: <https://www.ons.gov.uk/businessindustryandtrade/constructionindustry/datasets/interimconstructionoutputpriceindices>

¹⁸⁷ HM Treasury (2024), Forecasts for the UK economy: a comparison of independent forecasts. Available at gov.uk.

On the proposed materials, plant and equipment RPE true-up for enhancement, water companies mostly supported it but there are mixed views on the design:

- **Support for using COPI for the true-up was mixed.** United Utilities, Hafren Dyfrdwy, South East Water, SES Water, Affinity Water and Dŵr Cymru support using new infrastructure construction output prices (COPI) as the index for the 'true-up'. But Anglian Water, Severn Trent Water, Southern Water and Thames Water disagree. Arguments include: the index double counts the frontier shift challenge as it is an output measure; is based on the construction of roads and bridges which only make up a small part of water companies' enhancement; and concern around the spike in the index in 2022-23.
- **Support for a deadband was mixed.** Anglian Water, United Utilities, Dŵr Cymru, Wessex Water and Affinity Water disagree with a deadband. The most common reason being that there is no admin burden associated with the true-up. But Severn Trent Water, Hafren Dyfrdwy, and SES Water support a deadband, noting the index imperfections. Other water companies did not strongly oppose or support a deadband.
- **Anglian Water, Southern Water and Thames Water consider the same approach should be applied to base and enhancement.**

On chemicals, Thames Water and Northumbrian Water challenge the proposal not to have a chemicals RPE or associated true-up. Thames Water consider the materiality threshold applied is arbitrary, note that chemicals is material for bioresources, and note the close relationship between energy and chemical costs.

We consider stakeholder responses to the energy cost adjustment in section 2.

Our assessment and reasons

Labour costs

CEPA incorporated the latest independent labour earnings forecasts from 2024 to 2028 reported by HM Treasury to produce its updated labour RPE forecast.¹⁸⁸ This reflects the suggestion from Anglian Water and Thames Water and maintains internal consistency with our updated CPIH forecasts used for final determination.

Materials, plant and equipment costs

We will use the new infrastructure construction output prices (COPI) as the index for the materials, plant and equipment enhancement true-up. We agree with CEPA that stakeholders do not present sufficient and convincing evidence to justify an alternative index. No

¹⁸⁸ HM Treasury (2024), Forecasts for the UK economy: a comparison of independent forecasts, Table M6. Available at [gov.uk](https://www.gov.uk).

stakeholders that proposed an alternative index substantiated their proposal with robust quantitative evidence.

We recognise that new infrastructure COPI is not a perfect index as it is based on road and bridge construction. But the true-up will provide some protection to water companies if there is tightness in the infrastructure supply chain (which we would expect to impact the construction market in general rather than the water sector specifically) that would otherwise inhibit the delivery of the ambitious PR24 enhancement programme. And the true-up was broadly supported by stakeholders. We will use new infrastructure COPI in 2023-24 as the base year for the RPE true-up, which reflects the most recent outturn information available for final determinations. This addresses Severn Trent Water's main concern with the index.

We will not apply a deadband. Most respondents did not strongly support a deadband. And we do not consider there are any sufficient and convincing reasons why we should introduce a deadband. Both companies and customers will be protected if outturn materials, plant and equipment prices are different to forecast, which is important given the large increase in enhancement spend expected over the 2025-30 period.

We will not apply a materials, plant and equipment RPE true-up to base expenditure allowances. We retain our draft determination view that there is not a material wedge between ONS's repair and maintenance construction output price index and CPIH. Cost sharing is sufficient to mitigate the risk that outturn materials, plant and equipment prices are higher or lower than forecast for base expenditure allowances, like at PR19.

Chemical costs

We do not include a chemicals RPE in ex-ante expenditure allowance or introduce an ex-post true-up at final determinations.

Chemical costs represent an immaterial share of costs (less than 5%). Thames Water challenges the use of a materiality threshold to decide whether to introduce a RPE. But CEPA considers this is a necessary step in determining whether input price inflation could have a significant financial impact on the companies. The 10% materiality threshold strikes a fair balance between expecting companies to manage risks independently and providing support when those risks are beyond their control. This threshold is supported by regulatory precedent, having been used by Ofwat in PR19 and by Ofgem in RIIO-2.

Thames Water notes the materiality of chemical costs in bioresources. But this is mainly driven by outliers (Severn Trent Water and South West Water). Most companies report negative energy costs for bioresources, as they receive income from generating energy. This inflates the cost share of other costs, including chemicals.

The ONS chemicals price index does not significantly deviate from CPIH over the long term. This suggests that CPIH is a reasonable long-term proxy for chemical prices faced by water companies. And while CEPA considers it is the best chemicals price index available, it is not a good reflection of water company chemical costs as it covers a wide range of chemicals. CEPA does not consider it is feasible or proportionate to produce a bespoke chemicals price index based on the chemicals used by water companies using the limited detail provided in PR24 business plans and draft determination responses.

Our final determination

We maintain our draft determinations position on RPEs, which aligns with CEPA's recommendations:

- **Base wholesale labour costs:** include an ex-ante labour RPE in expenditure allowances with an ex-post 'true-up' mechanism based on the ONS manufacturing wages index.
- **Enhancement wholesale labour costs:** include an ex-ante labour RPE in expenditure allowances with an ex-post 'true-up' mechanism based on the ONS construction index.
- **Base materials, plant and equipment costs:** no ex-ante RPE or ex-post 'true-up' mechanism.
- **Enhancement materials, plant and equipment costs:** no ex-ante RPE but an ex-post 'true-up' mechanism based on the ONS new infrastructure COPI index.
- **Chemicals costs:** no ex-ante RPE or ex-post 'true-up' mechanism
- **Other costs:** no ex-ante RPE or ex-post 'true-up' mechanism.

The table below sets out key RPE assumptions made in PR24 final determinations that will be needed for the PR24 end-of-period reconciliation.

Table 33: Labour RPE at PR24 final determinations

	2025-26	2026-27	2027-28	2028-29	2029-30
Labour RPE – PR24 final determinations	1.28%	1.16%	0.95%	0.64%	0.88%
Labour cost share – wholesale water – base	33.5%	33.5%	33.5%	33.5%	33.5%
Labour cost share – wholesale water – enhancement	37.3%	37.3%	37.3%	37.3%	37.3%
Labour cost share – water network plus – base	36.4%	36.4%	36.4%	36.4%	36.4%
Labour cost share – water network plus – enhancement	41.0%	41.0%	41.0%	41.0%	41.0%
Labour cost share – bioresources – base	42.3%	42.3%	42.3%	42.3%	42.3%
Labour cost share – bioresources – enhancement	36.0%	36.0%	36.0%	36.0%	36.0%

Labour RPE – base true-up index	ASHE manufacturing mean hourly earnings including overtime ¹⁸⁹
Labour RPE – enhancement true-up index	ASHE construction mean hourly earnings including overtime ¹⁹⁰

Table 34: Materials, plant and equipment (MPE) enhancement RPE assumptions at PR24 final determinations

	2025-26	2026-27	2027-28	2028-29	2029-30
Materials, plant and equipment (MPE) enhancement RPE – PR24 final determinations	0%	0%	0%	0%	0%
MPE cost share – wholesale water – enhancement	36.7%	36.7%	36.7%	36.7%	36.7%
MPE cost share – water network plus – enhancement	37.9%	37.9%	37.9%	37.9%	37.9%
MPE cost share – bioresources – enhancement	29.3%	29.3%	29.3%	29.3%	29.3%
MPE RPE – enhancement true-up index	ONS new infrastructure COPI ¹⁹¹				

4.1.3 Input price inflation – retail

What we said in our draft determinations

We did not allow for automatic indexation of allowed retail costs to CPIH in our draft determinations. This is consistent with our PR19 approach.

But we recognised the change in the macroeconomy since setting PR19 allowances, with higher levels of general inflation and nominal wage growth. We acknowledged the impact this may have on companies' ability to manage retail costs. In particular, labour costs, which account for 45% of total retail costs on average.

We sought to reflect these cost pressures in our draft determination retail allowances. In line with CEPA's recommendation, we assumed a long-term nominal wage growth assumption of 2.5% per year. We reflected this in our retail allowances through the application of a labour RPE of 0.5% per year.

Stakeholders' representations

Respondents broadly supported our draft determination proposal to reflect forecast input price pressures faced by retailers into nominal retail expenditure allowances. But four

¹⁸⁹ ONS ASHE Manufacturing mean hourly earnings, gross pay including overtime (“Earnings and hours worked, industry by four-digit SIC: ASHE Table 16.5a” available at ons.gov.uk)

¹⁹⁰ ONS ASHE Construction mean hourly earnings, gross pay including overtime (“Earnings and hours worked, industry by four-digit SIC: ASHE Table 16.5a” available at ons.gov.uk)

¹⁹¹ ONS Construction output price index – New work: Infrastructure (“Construction output price indices – Table 2” available at ons.gov.uk)

companies argue that retail controls should be indexed to CPIH due to the inflationary risk borne by companies with nominal allowances¹⁹², and Dŵr Cymru suggest a labour RPE true-up.

Dŵr Cymru and United Utilities encourage us to align our treatment of inflation across retail and wholesale at PR29. Dŵr Cymru also suggest we consider cost sharing at PR29.

Our assessment and reasons

Water companies positively acknowledged that we reflected forecast nominal input price pressures in ex-ante expenditure allowances in draft determination responses. No substantive new evidence was provided in draft determination responses.

We have updated nominal retail expenditure allowances at final determination to reflect the latest labour cost share information in draft determinations representations and updated Ofwat CPIH forecasts. We have maintained our long-term CPIH forecast of 2 percent per year to calculate the labour RPE.

Our final determination

We retain our draft determination approach to retail input price inflation. We reflect expected input price pressures in the revenue limit we set companies at the outside of the price control. This includes a labour RPE of 0.5 percent per year, which is based on a long-term nominal wage growth assumption of 2.5% and long-term CPIH assumption of 2%. We do not allow automatic indexation of allowed retail costs to CPIH. This approach provides appropriate incentives for retailers to manage input price pressures given they are best placed to manage them.

4.2 Improving performance with cost allowances

We expect companies to make significant performance improvements from enhancement expenditure over the 2025–30 period. In some areas we are providing significant enhancement expenditure which should directly lead to improvements in performance.

For example, we allow £11.3 billion to improve storm overflows. This will fund improvements to 2,884 storm overflows and remove over 181,000 spills by 2029.

We allow £6.0 billion to remove nutrients from water bodies. This is around twice the expenditure in PR19 and should fund a reduction in phosphorus at around 1000 sites and catchments.

¹⁹² Northumbrian Water, Thames Water, Wessex Water, Dŵr Cymru

We also allow £0.7 billion million of enhancement expenditure to reduce leakage in the water network, and £258 million of enhancement expenditure to improve water efficiency. This investment together with a further £1.7 billion to install 10.4 million smart meters will help companies to reduce leakage by 14% and per capita consumption by 7% by 2029–30.

Enhancement expenditure allowances are also likely to have a large indirect impact on company performance. For example, supply interconnectors investment is likely to improve water supply interruptions performance. And water quality enhancement will improve compliance risk index performance.

We also expect companies to make performance improvements through base expenditure allowances. For example, where performance issues are related to operational or maintenance issues. Most companies identified performance improvements from base expenditure historically.¹⁹³ And base expenditure allowances are 19% higher than at PR19, and this increase will go towards delivery of performance improvements such as pollution incidents (a 30% reduction by 2029–30) and internal sewer flooding incidents (a 24% reduction by 2029–30 for almost all companies). In addition, water mains renewals should reduce mains repairs over the long term, and rising mains renewals should reduce the number of pollution incidents.

4.2.1 Improving the link between cost and service at PR24

We improved the link between cost allowances and service expectations at PR24 to ensure we set performance commitment levels that can be achieved by efficient companies with total expenditure allowances:

- We use historical information to help set base expenditure allowances and what performance improvements can be delivered from base expenditure allowances.
- We assessed performance improvements that efficient companies on base expenditure have delivered in the past and are forecasting to deliver in the future.
- We explored root causes of performance issues faced by water companies to determine if differences in performance levels between companies are caused by factors outside of company control (eg environmental factors) or inside of company controls (eg company response to water supply interruption incidents).

The figures below show performance efficiency scores against historical base efficiency scores. Performance efficiency scores are calculated by comparing performance in the 2020–24 period against the PR19 2020–24 PCL. We take the average of all performance commitment efficiency scores to create a one performance efficiency score. This includes water supply

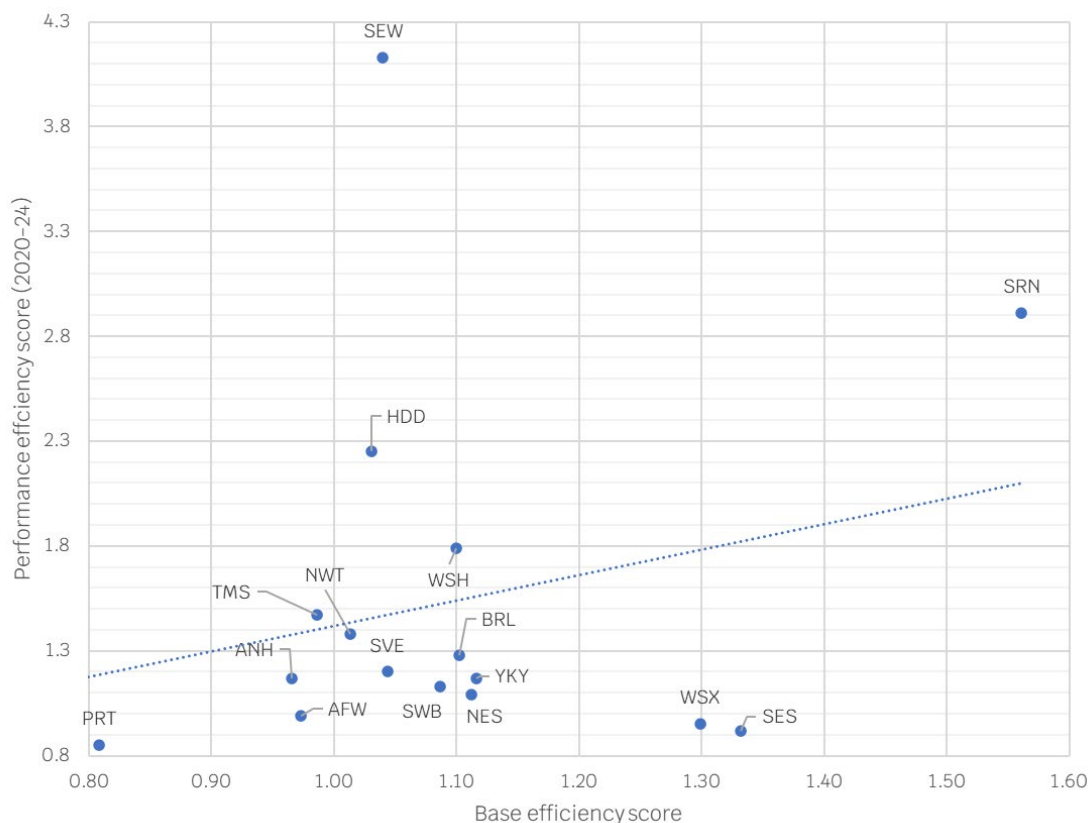
¹⁹³ Ofwat, 'Information notice 23/07 Assessing the influence of enhancement expenditure on historical performance trends for PR24', July 2023, pp.6.

interruptions, internal and external sewer flooding, compliance risk index, total pollution incidents, sewer collapses, mains repairs, unplanned outage, leakage and customer contacts about water quality.¹⁹⁴ A performance efficiency score greater than one for the 2020–24 period indicates the company has not delivered the PR19 PCL. Performance efficiency scores increase as the performance gap to PCL increases.

Historical base cost efficiency scores are calculated by comparing outturn costs over last five years (2019–20 to 2023–24) versus predicted costs from the base cost benchmarking models. A base cost efficiency score above one indicates the company incurred higher costs than the models predicted over the 2019–24 period.

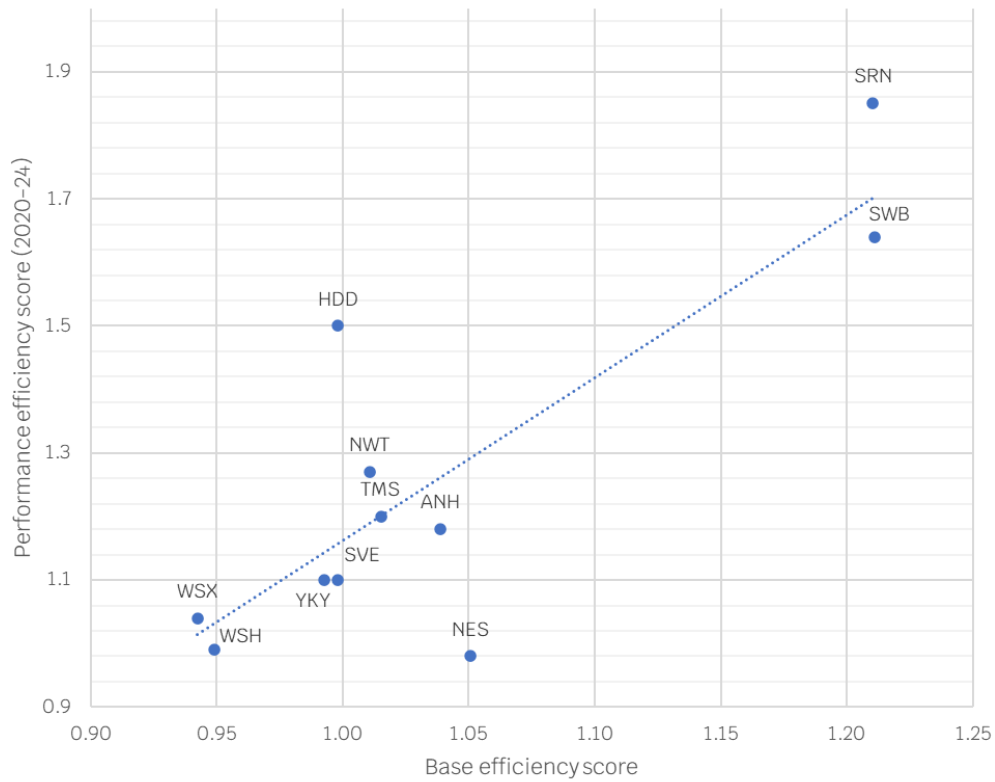
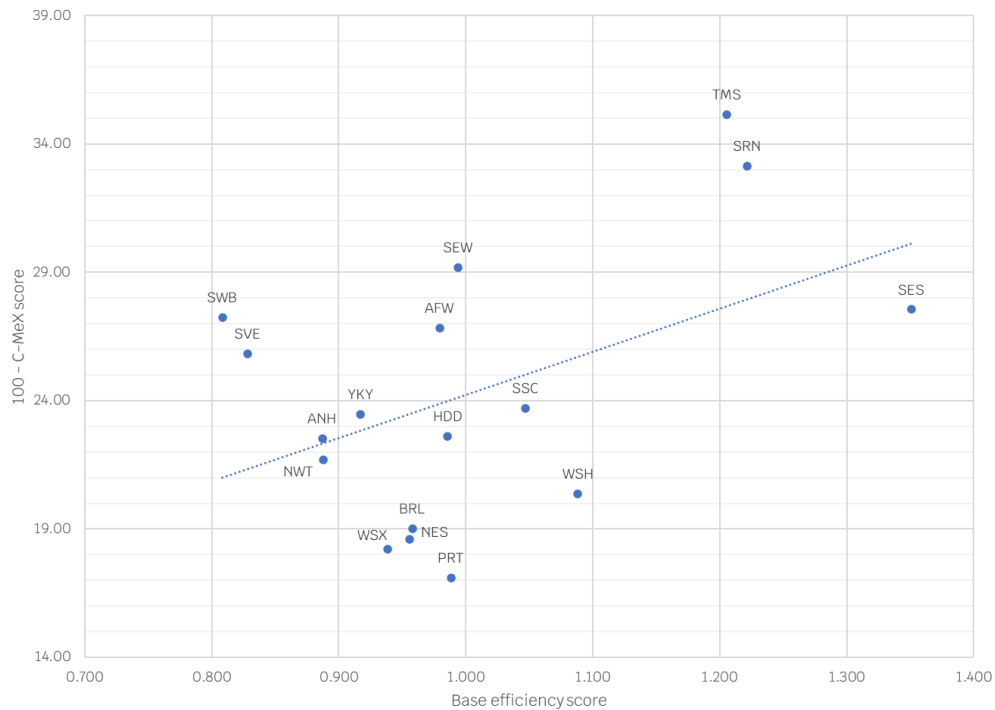
Like in PR19, we find no evidence to suggest that cost efficient companies perform poorly on outcomes. This is consistent with the findings of the CMA PR19 redeterminations.¹⁹⁵ It is possible to be efficient on cost and high performing on service. For example, Portsmouth Water perform well on wholesale water base cost efficiency and service performance.

Figure 16: Water base cost efficiency versus service performance



¹⁹⁴ Note we exclude per capita consumption due to the impacts of COVID-19 on PCC performance.

¹⁹⁵ CMA, 'Final Report price determinations', March 2021, pp. 29

Figure 17: Wastewater base cost efficiency versus service performance**Figure 18: Residential retail base cost efficiency versus C-MeX performance**

We received the following stakeholder responses to our draft determinations on the link between cost and service:

- United Utilities consider it is inappropriate to assume that achieving ever improving performance levels is possible without increases in base expenditure allowances. The company presents a comparison between base costs and a composite performance index over time, which it considers presents a clear positive trend (ie better performance is associated with higher base costs).
- Yorkshire Water, South East Water and SES Water consider the disconnect between cost and service has not been addressed, and that totex allowances do not fund efficient service levels. Yorkshire Water commissioned Oxera to explore this further, with the most material issue raised being the decision to assume companies meet PR19 PCLs when setting PR24 PCLs. Oxera propose four alternative approaches to assess performance levels that can be delivered with expenditure allowances:
 - **Industry average performance** – estimate the implicitly funded level of service based on industry average performance in the outturn period.
 - **Predicted performance – cost drivers** – estimate a regression of performance on base cost drivers.
 - **Predicted performance – service drivers** – estimate a regression of performance on drivers that drive differences in performance between companies.
 - **Cost-outcomes integrated analysis** whereby core performance measures are modelled simultaneously alongside costs.

We are disappointed these companies consider we have overlooked the cost-service relationship. This was a key part of our PR24 methodology and we engaged extensively with the sector on this issue. Firstly through the [cost assessment working group](#) and '[Assessing base costs at PR24](#)' consultation in 2021, which highlighted the challenge in examining the link between cost and service. Allocating costs to individual performance measures was highlighted as a key challenge given expenditure can drive performance improvements across multiple performance areas. We reflected on stakeholder feedback in our [PR24 methodology](#), where we consulted on our proposed approach to setting PCLs at PR24. We also explored econometric modelling, like that suggested by Oxera, for leakage, per capita consumption and greenhouse gas emissions.¹⁹⁶ Overall, we have achieved a better link between costs and outcomes at PR24 for the reasons set out above, and we are keen to build on this work with the sector for PR29 and beyond.

All four companies that commented explicitly on the link between cost and service fail to account of the potential for companies to achieve performance improvements by implementing better practices rather than by spending more. The fact that companies have achieved performance improvements from base expenditure allowances in the past

¹⁹⁶ Ofwat, 'PR24 final methodology – Appendix 9 – Setting expenditure allowances', page 73.

demonstrates that this is possible. Most companies identified performance improvements from base expenditure historically.¹⁹⁷

United Utilities' analysis of trends in performance versus costs is overly simplistic as it fails to explore what factors have driven increases in costs over time. We know that companies' relatively high base costs in recent years are driven by various factors, including relatively high input price pressures (eg energy); capital maintenance investment to address issues at treatment works and in the network; and investment to deliver performance improvements. This demonstrates the challenge in quantifying the cost and service link. As explained in section 2, we set the base cost catch-up efficiency challenge using the last 5-years of outturn data to reflect most recent cost pressures and efficiency evidence. United Utilities do not recognise this or that this approach may overlap with the energy cost adjustment.

In addition, no water companies addressed Europe Economics' analysis,^{198 199} which showed that performance improvements from base expenditure allowances can be achieved alongside the application of frontier shift efficiency for two main reasons:

While there could be a theoretical overlap between outcomes stretch and frontier shift in the water sector, this overlap is likely minimal.

- This is primarily because only four performance commitments are relevant to quality adjustments of water sector output — the theoretical basis for frontier shift being “double-counted” when Ofwat sets both a frontier shift challenge and includes outcomes stretch in PCLs. These are outcomes that relate to the specification of the service delivered to end-customers: water supply interruptions, internal sewer flooding, customer contacts about water quality, and external sewer flooding. ONS does not apply quality adjustments for environmental standards achieved in the production process, change in asset health, or customer satisfaction.
- Moreover, even among these specific outcome measures, only a part of the required stretch reflects frontier shift. The remainder relates to catch-up efficiency and potentially an increase in capital inputs. Thus, the theoretical risk of “double-counting” frontier shift is limited.

It is unlikely that any overlap between frontier shift and PCL stretch exists in practice.

- Europe Economics' research indicates that the ONS applies minimal quality adjustments to price deflators outside of highly innovative sectors, such as computing. As a result, the

¹⁹⁷ Ofwat, '[Information notice 23/07 Assessing the influence of enhancement expenditure on historical performance trends for PR24](#)', July 2023, pp.6.

¹⁹⁸ Ofwat, '[PR24 draft determinations – Expenditure allowances](#)', July 2024, section 4.2.2.

¹⁹⁹ Europe Economics, '[Frontier Shift and Outcomes Stretch at PR24](#)', March 2023.

total factor productivity estimates for Ofwat's comparator sectors are unlikely to account for improvements in output quality.

- Additionally, companies in these comparator sectors are incurring significant expenditure due to stricter regulatory demands, meaning water companies are not unique in facing these challenges.

We have reassessed PCLs in response to stakeholder responses to our draft determinations and 2023–24 outturn performance. When setting the 2024–25 baseline, we have put a greater emphasis on recent performance levels and moved away from the default position of adopting PR19 performance commitment levels.

Overall, we have set performance commitment levels at final determinations that are achievable. In setting PCLs, we have sought to best achieve a range of objectives, reflecting both consumer and wider strategic priorities. To do this, we have considered a combination of historical performance, econometric modelling, engineering rationale, long-term targets, our efficient cost allowances, and companies' own forecasts to set forecasts of good performance for PR24. Please see 'PR24 final determinations: Delivering outcomes for customers and the environment' for more details.

4.3 Catchment and nature-based solutions

In the PR24 methodology we stated that we want companies to deliver greater social and environmental value, so they can deliver more for the funding that customers provide. This includes making a step change increase in the use of catchment and nature-based rather than traditional solutions. We have supported this through our enhancement assessment.

We encouraged companies to seek partnership contributions to enhancement investments where the investment delivers wider benefits. We aimed to achieve this by deducting partnership contributions from enhancement cost benchmarking, and allowing efficient companies to keep a proportion of the partnership funding if they outperform the cost benchmark.

We expected companies to consider best value and environmental and social factors when developing enhancement proposals. We consider best value assessments as part of cost benefit appraisals in our deep dive assessments and expect companies to consider best value when developing WINEP, WRMP and DWMP proposals.

What we said in our draft determinations

At draft determination we stated that when looking at company assessments, we found that in many cases the benefit data included in business plans was not sufficiently robust or well developed to provide a robust view as to whether business plans offer best value. Going

forward we expect companies to improve their approaches to benefit valuation and options appraisal.

We supported catchment and nature-based solutions by benchmarking green solutions separately to grey solutions where they might cost more so that green solutions are not disadvantaged. We identified green-only solutions and hybrid solutions that incorporate significant catchment and nature-based elements to make sure that the additional benefits are considered as part of our assessment.

We wanted companies to go further on catchment and nature based solutions for storm overflows, so retained flexibility in our proposed price control deliverable, allowing companies to deliver more green solutions as opposed to grey by focusing on equivalent storage as opposed to actual storage as the main measure of delivery.

In our PR24 methodology, we said we would provide a ten year allowance for the efficient ongoing opex related to nature-based solutions that are wholly or primarily opex based. The aim of this was to encourage companies to put forward enhancement proposals nature based solutions. Companies did not clearly set out in business plans where ten-year enhancement opex allowances are required, and we asked companies to clearly set out in their representations where ten year enhancement opex allowances are required so we could include in our final determinations.

Stakeholders' representations

In response to our draft determination:

The Wildlife Trust states it is are "disappointed at the relatively low proportion of overall spend allocated" for the delivery of catchment and nature based solutions. The Wildlife Trusts express concern that some proposals for catchment and nature based solutions have been left out of business plans, potentially due to "lack of regulator support". They disagree with Ofwat's approach to best value analysis, suggesting sector-wide work is needed to develop a robust model for cost-benefit analysis of green solutions and that Ofwat takes a more consistent approach rooted in natural capital accounting.

The Royal Society for the Protection of Birds (RSPB) state that Ofwat's draft determinations "miss opportunities to further enhance efficiency and impact" by only 2% of the total investment being directed towards nature-based solutions. The RSPB ask that Ofwat collaborate with the Environment Agency for its final determinations to guide water companies toward prioritising catchment and nature based solutions under a "nature first" approach.

The Wildlife and Countryside Link (Link) expressed concern that opportunities to further maximise the efficiency and impact of enhancement/environmental spend have been missed in Ofwat's draft determination, notably that only £2.2 billion of total investment will go

towards multi-benefit catchment and nature based solutions. Similarly to RSPB, Link also urges Ofwat to collaborate with the Environment Agency to steer companies to deliver catchment and nature based solutions where possible under a "nature first" approach.

Wales Environment Link states that it has raised concerns and disappointment at the slow pace of adoption of nature based solutions and feel that Ofwat has not fully appreciated the extent to which this has been held back by Natural Resources Wales's permitting policy. The risk-averse approach that has so far been taken in Wales, compared with England, has been a barrier to wider adoption of nature based solutions. Currently, nature based solutions cannot be rolled out until evidence from pilot projects has been gathered and only the water companies are allowed to work on nature based solutions in Wales, further slowing down the roll-out of potentially beneficial projects. Wales Environment Link would like to see Ofwat engage further with NRW and the Welsh Government on this to try to remove policy barriers where possible.

The Consumer Council for Water (CCW) states that it is pleased to see £2.2 billion in PR24 is to be spent on nature-based solutions, including £1.6 billion to reduce storm spills through sustainable drainage systems (eg wetlands). CCCWs December 2023 research shows that households would be willing to pay up to £40 a year more on their water bill to use nature instead of man-made materials to improve river water quality and reduce the risk of flooding

Our assessment and reasons

We agree with the Wildlife Trust that a more robust model for cost-benefit analysis of green solutions is required. Within the final determination, we have not rejected schemes for catchment and nature based solutions. We have only challenged companies on cost efficiency for catchment and nature base solutions and whether the scheme is already funded through base expenditure allowances.

We share the concerns of the environmental non-governmental organisations (eNGO) that only 2% of the total investment is dedicated towards catchment and nature-based solutions. While we support companies going further on nature based solutions, it is for companies to propose where these can be implemented, and to agree relevant schemes with the Environment Agency or Natural Resources Wales as part of the WINEP/NEP process.

Where possible, we want companies to go further and deliver more catchment and nature-based solutions in the 2025-30 period.

We continue to strongly support catchment and nature based solutions where they are deemed to be acceptable by the environmental regulators (Environment Agency / Natural Resources Wales). We acknowledge concerns over what some perceive to be a risk averse approach to permitting, but we cannot approve investment if it is not supported by the Environment Agency and Natural Resources Wales.

For storm overflows, we provide flexibility for companies to go further on catchment and nature-based solutions in the 2025–30 period by focussing on equivalent storage as opposed to actual storage as the main measure of delivery within our price control deliverables for the grey/green hybrid model, allowing companies to deliver more green / adopt a green first approach where feasible. We have changed our policy so that we allow companies to swap between grey/green hybrid solutions and green only solutions if approved by the EA/NRW, removing the perceived blockers raised by some companies and environmental regulators, further details are provided in section 3.3.2.

Our final determination

Overall, we have made an enhancement allowance of around £3.3 billion for catchment and nature-based solutions.

For storm overflows, £2.6 billion of the total enhancement allowance is for catchment and nature-based solutions, but we want companies to go further. We have retained flexibility in our proposed price control deliverable, allowing companies to deliver more green solutions as opposed to grey by focusing on equivalent storage as opposed to actual storage as the main measure of delivery, and expanded the flexibility to enable swaps between the grey/hybrid model and the green only model.

For nutrients and sanitary determinands, we have allowed £250 million for catchment and nature-based solutions covering nutrient balancing, catchment permitting and nature-based solutions.

Catchment and nature-based solutions appear regularly in several of the Water WINEP enhancement categories, notably Drinking Water Protected Areas with a final determination allowance of £140 million and Biodiversity and conservation with an allowance of £202 million.

We are also making allowances for developing an improved partnership catchment and nature-based approach under the A-WINEP for Anglian Water (£26 million) to create a partnership centre of excellence focussed on nature-first solutions, in addition to £231 million for United Utilities A-WINEP, which is covered under Storm Overflows focussing on using catchment and nature-based solutions to reduce spills.

There are also expenditure proposals for catchment or nature-based solutions under other wastewater and water cost lines with WINEP/NEP actions which we have assessed and proposed allowances for. For example, under restoration management we propose an allowance for Northumbrian Water for WINEP marine conservation zone actions (£7m), under river connectivity an allowance is proposed for United Utilities and Dwr Cymru for catchment fish passage WINEP/NEP actions (£13m combined). Under habitat restoration Wessex Water are given an allowance (£7m) for two catchment partnership projects and Dwr Cymru (£4m) for invasive and non-native species and biodiversity NEP actions. Under the 25-year

environment plan line Northumbrian Water receives an allowance (£65m) to continue with an Integrated Drainage Partnership initiative (NDIP) on catchment flood alleviation schemes, other catchment schemes and investigations into sustainable urban drainage systems (SUDS) and Wessex Water (£3m) for a catchment partnership WINEP action.

In our PR24 methodology, we said we would provide a ten year allowance for the efficient ongoing opex related to nature-based solutions that are wholly or primarily opex based. The aim of this was to encourage companies to put forward enhancement proposals nature-based solutions. Companies have still not clearly set out in business plans where 10-year enhancement opex allowances are required. Companies will need to identify which solutions qualify for 10-year enhancement opex allowances as part of their PR29 submissions.

The total allowance given for catchment and nature-based solutions is broken down by company below.

Table 35: Total allowance given for catchment and nature-based solutions

Company	Total Allowance (£ million)
Anglian Water	235.27
Dŵr Cymru	65.92
Hafren Dyfrdwy	1.47
Northumbrian Water	887.90
Severn Trent Water	302.15
South West Water	253.25
Southern Water	530.41
Thames Water	201.93
United Utilities	424.53
Wessex Water	152.79
Yorkshire Water	178.84
Affinity Water	8.60
Bristol Water	3.02
Portsmouth Water	0.00
South East Water	23.58
South Staffs Water	10.05
SES Water	0.41
Total	3280.11

4.4 Transition expenditure programme and accelerated infrastructure delivery project

The transitional expenditure programme allows companies to bring forward enhancement expenditure funded as part of PR24 so that it can be delivered in the current price control period. The expenditure would be funded as part of the PR24 process.

We expanded the scope of the transition expenditure programme at PR24 to cover 2023–24 and 2024–25 given the expected large increase in enhancement expenditure. The aim was to enable the increase in investment to be spread over the PR19 and PR24 periods. The transition expenditure programme should not be used to propose investments that have deliverables that are already required in this price control period (2020–25) or that have been previously funded, or to propose investment related to base expenditure allowances.

Expenditure approved through the accelerated infrastructure delivery project is also funded through the transitional expenditure programme.

4.4.1 Accelerated infrastructure delivery project

In June 2023, we published our final decisions on the accelerated infrastructure delivery project, which sets out our final decisions for projects where we would allow expenditure to be accelerated through the transitional expenditure programme²⁰⁰. To provide companies with additional certainty to take forward schemes, Ofwat agreed with Defra to take forward an accelerated infrastructure delivery project for English water companies. This acceleration process provides companies with certainty that approved schemes would be funded through the transition expenditure programme at PR24. We have assessed the efficiency of the schemes as part of our PR24 cost assessment process. The accelerated infrastructure delivery project approved projects in three main areas:

- water resilience projects covering seven smart metering schemes, six water supply schemes, and three water quality schemes;
- storm overflow projects: covering ten schemes across seven companies; and
- nutrient neutrality: covering 14 phosphorus removal schemes across three companies²⁰¹.

What we said in our draft determinations

At draft determination, we approved acceleration expenditure for all nutrient neutrality schemes following the Levelling-up and Regeneration Act (2023); except for Warwick Bridge STW scheme from United Utilities which proposed to withdraw the scheme and instead

²⁰⁰ Ofwat, Accelerated infrastructure delivery project: final decisions, June 2023.

²⁰¹ The approval of the nutrient neutrality schemes was conditional on the relevant legislation being enacted, and the nutrient neutrality designation being made. The legislation has now been enacted under the Levelling-up and Regeneration Act (2023) and all catchments and schemes have been designated and included in PR24 WINEP.

submitted a catchment solution amendment proposal which was under consideration by Defra and the Environment Agency. We also reviewed the reprofiled delivery proposed by United Utilities and South West Water for their accelerated nutrient neutrality phosphorus schemes and accepted most revised dates apart from where they are in 2029-30 as this does not represent accelerated delivery. We have reflected the dates in price control deliverables.

On storm overflows, we approved the concept and definition phase of Northumbrian Water's Berwick on Tweed storm overflows projects through the accelerated funding process. As this phase is not due for completion until 31st March 2025, there is uncertainty in the scheme cost and benefits. At draft determination, we proposed to apply our large scheme approach to address the resulting uncertainty through enhanced engagement and cost sharing.

Yorkshire Water proposed changes to its approved accelerated infrastructure programme in their business plan submission, which we have assessed for draft determinations. As a result, investment requests reduced since the initial assessment of the accelerated schemes from £80m (22/23 CPIH) to £62m (22/23 CPIH), mainly due to not implementing tertiary treatment at three sites. In our draft determinations, we notified Yorkshire Water that their draft determination response must account for any changes to the WINEP discussed and agreed with the Environment Agency and where this affects the company's proposals, including investment costs and scope required to meet the statutory requirements.

On water resilience schemes, we retained the delivery dates from the accelerated infrastructure process for the drinking water quality schemes resulting in earlier delivery of Affinity Water's Broome and Kingsdown schemes compared to the DWI legal instruments.

Overall companies requested a total of £445 million of accelerated funding for the period 2023-2025 in business plan submissions for their WINEP/NEP, WRMP and drinking water quality programmes. South Staff Water (including Cambridgeshire) received approval for accelerating household and non-household meters in the accelerated process, with a potential cost of £20 million. However, it chose not to submit these requests in the business plan and accelerate meter delivery during 2023-25

Where companies submitted inefficient costs when assessed against our benchmark or have not provided sufficient and convincing evidence against our assessment criteria, they received an allowance of less than requested. United Utilities received a significant efficiency challenge due to proposing high costs for storm overflows schemes.

At draft determination, we allowed companies a total of £346 million for accelerated programme expenditure with £228 million to support the acceleration of wastewater schemes and £117 million for water schemes.

Stakeholders' representations

South Staff Water (including Cambridgeshire) received approval for accelerating household and non-household meters in the accelerated process, with a potential cost of £20 million. At final determination, the company has retained its position and chose not to submit these requests in the business plan and accelerate meter delivery during 2023-25. Similarly, South West Water has chosen not to submit requests for approved accelerated programme expenditure for its customer leak replacement programme with a potential cost of £9 million. South West Water (Bristol area) also chose not to submit request for approved accelerated programme expenditure for replacements of supply pipes to remove leaks on customer's properties and for lead pipes replacements with a potential cost of £3 million.

For final determination, Anglian Water proposed to move forward some of its accelerated programme expenditure to 2023-25 as part of the delivery of its water re-use scheme to extend its sampling programme. The company also requested a 6-months extension to the original delivery dates for two of its nutrient neutrality schemes approved under the accelerated infrastructure delivery process.

At final determination, Southern Water proposed a change to its storm overflow reduction schemes originally approved under the accelerated infrastructure delivery process with the aim to deliver another 120 yearly spills reduction, on top of the original 420 yearly spill target.

Overall companies requested a total of £438 million of accelerated funding for the period 2023-2025 in business plan submissions for their WINEP/NEP, WRMP and drinking water quality programmes. This includes £125 million funding request against water cost lines and £314 million funding request against wastewater cost lines.

Our assessment and reasons

We have reviewed companies accelerated process expenditure requests to validate alignment with the June 2023 decision on approved accelerated schemes.

We retain our decision to approve all nutrient neutrality schemes following the Levelling-up and Regeneration Act (2023). We accept most revised delivery dates proposed by United Utilities and South West Water for their accelerated nutrient neutrality phosphorus schemes to assist delivery apart from where they are in 2029-30 as this does not represent accelerated delivery. We have reflected the dates in price control deliverables. We accept Anglian Water's proposed delivery dates for the schemes at Dereham and Fakenham and amended our price control deliverables accordingly.

We retain our draft determination decision on storm overflows and approved the concept and definition phase of Northumbrian Water's Berwick on Tweed storm overflows projects through the accelerated funding process. We apply our large scheme approach to address the remaining uncertainty through enhanced engagement and cost sharing. We have reviewed Southern Water's proposal to accelerate additional storm overflow schemes to achieve reduction of another 120 yearly spills on top of the 420 yearly spill target originally approved

under the accelerated infrastructure delivery process. We allow the request as part of our traditional transition expenditure process since the schemes are in the PR24 WINEP programme.

We allow accelerated funding for Yorkshire Water Wheatcroft CSO scheme which was approved under the original accelerated infrastructure delivery process. However, in the final update of the PR24 WINEP programme, the Environment Agency have confirmed that they will remove this line from the action list on the basis that the scheme performance was improved to support meeting Excellent and should not have a substantive impact on the achievement of any of the bathing water standards. We therefore request that Yorkshire Water use the funding to deliver another scheme instead or return the money to customers. We have reflected this under our price control deliverables mechanism for storm overflow. We allow discreet changes to the list of sites as detailed in our Price control deliverables appendix; providing that the company obtains agreement from the Environment Agency. In this case, the company will remain constrained to the modelled allowance for Wheatcroft CSO scheme.

On Yorkshire Water's Ilkley inland bathing water scheme, the Environment Agency has approved Yorkshire Water's proposed aerated rush bed and integrated wetland scheme as a trial subject to monitoring and reporting. It is up to Yorkshire Water to deliver a best value scheme to meet the drivers of the scheme of reducing storm overflow spills and improving river water quality appropriate to the impact of the discharge in relation to all sources of pollution. We have allowed accelerated funding for the scheme which was approved under the original accelerated infrastructure delivery process and we provide flexibility for the company to deliver the scheme in the most appropriate manner to deliver the required outcomes and meet the statutory standards.

On water resilience schemes, we retain the delivery dates from the accelerated infrastructure process for the drinking water quality schemes as set out in our draft determination. This results in earlier delivery of Affinity Water's Broome scheme compared to the DWI legal instruments which is in accordance with the delivery date set out by the company as part of the accelerated infrastructure process.

Where companies submitted inefficient costs when assessed against our benchmark or have not provided sufficient and convincing evidence for proposed costs against our assessment criteria, they receive an allowance less than requested. United Utilities receive a significant efficiency challenge due to proposing high costs for storm overflows schemes.

Our final determination

At final determination, we have allowed companies a total of £351 million for accelerated programme expenditure with £246 million to support the acceleration of wastewater schemes and £105 million for water schemes.

Table 36: Accelerated programme expenditure allowances

Company	Total water allowance (£ million)	Total wastewater allowance (£ million)	Total allowance (£ million)
Anglian Water	12.16	23.52	35.68
Dŵr Cymru	0.00	0.00	0.00
Hafren Dyfrdwy	0.00	0.00	0.00
Northumbrian Water	14.82	1.77	16.58
Severn Trent Water	57.10	10.68	67.79
South West Water	3.53	19.51	23.03
Southern Water	0.00	31.27	31.27
Thames Water	0.00	0.00	0.00
United Utilities	0.00	131.41	131.41
Wessex Water	0.00	0.00	0.00
Yorkshire Water	0.00	27.38	27.38
Affinity Water	9.42	0.00	9.42
Bristol Water	0.00	0.00	0.00
Portsmouth Water	8.22	0.00	8.22
South East Water	0.00	0.00	0.00
South Staffs Water	0.00	0.00	0.00
SES Water	0.00	0.00	0.00
Total	105.26	245.53	350.79

4.4.2 Transition expenditure programme

What we said in our draft determinations

At draft determination, we allowed a total of £642 million of transition funding in years 2023-24 and 2024-25 across water and wastewater lines. Most of this funding was allowed for early expenditure associated to the WINEP/NEP programme.

At draft determination, we rejected the following requests for the transition expenditure programme as they did not meet our criteria.

- Severn Trent Water and United Utilities' request for transition funding under growth at sewage treatment works for year 2023-24 as it is not part of the WINEP/NEP programme. Although there might be investments related to the WINEP/NEP schemes, these should be separate, and funding should not overlap. We have assessed the request as part of our cost assessment process and set the allowances to start in year 2024-25.
- Northumbrian Water and Affinity Water requested transition funding under the water resilience line for 2024-25. Yorkshire Water requested transition funding under the lead and taste, odour and colour enhancement categories. However, the companies did not

justify the early start. We have assessed the request as part of our cost assessment process and set the allowances to start in year 2025–26.

Stakeholders' representations

Yorkshire Water has represented on the rejection of transition funding against the request made under the lead and taste, odour and colour enhancement categories. The company requested that Ofwat recognise the need for early expenditure to allow completion of the investigations required to meet the DWI compliance date at Ingbirchworth WwTW.

Affinity Water has represented on the overall cost efficiency challenge applied to its request for investment under the water resilience line to support the delivery of its Connect 2050 schemes. The company has submitted additional evidence to support the justification for the scheme and how the proposed solutions are best options for customers.

Neither Severn Trent Water nor United Utilities have represented on the reprofiling of growth investment to start in 2024–2025.

Our assessment and reasons

At final determination, we assessed a total of £296 million and £689 million of transition funding in years 2023–24 and 2024–25, respectively across water and wastewater cost lines. We evaluated the companies requests for transition expenditure based on the criteria set out in the PR24 methodology. Companies are eligible for transition funding for the 2023–24 year provided they meet the following criteria:

- the company provides sufficient and convincing evidence to justify the early start; and
- the expenditure relates to schemes included in a final WRMP24 or statutory requirements set out in final PR24 WINEP/NEP submission, where early delivery helps reduce overall delivery costs and helps earlier delivery of customer and environmental benefits.

Companies are eligible for transition funding for the 2024–25 year provided they meet the following criteria:

- the company provides sufficient and convincing evidence to justify the early start;
- the investment has early statutory deadlines in the next price control period;
- the expenditure relates to early design and planning of large, non-routine investments; or
- the expenditure relates to schemes included in a final WRMP24 or statutory requirements set out in final PR24 WINEP/NEP submission, where early delivery helps reduce overall delivery costs and helps earlier delivery of customer and environmental benefits.

At draft determination, we disallowed Severn Trent Water and United Utilities' their requests for transition funding under the growth at sewage treatment works for year 2023–24. For final determination, the companies have clarified the proportion of the cost requests that are

driven by WINEP drivers (where there exists an overlap with growth drivers). The companies have provided sufficient evidence and at final determination, we accept the requests.

We also accept Yorkshire Water request for transition funding under the lead and taste, odour and colour enhancement categories which we rejected at draft determination. The company has provided sufficient evidence to justify that the expenditure is required to meet statutory obligations,

We reject the following requests for the transition expenditure programme as they do not meet our criteria:

- Northumbrian Water request for transition funding under the water resilience line for 2023-2024 and 2024-25. The request is not justified by a need to meet statutory obligations and the company has not provided sufficient and convincing evidence to justify the early start. We have assessed the request as part of our cost assessment process and set the allowances to start in year 2025-26.
- Southern Water request for transition funding under the supply demand balance improvements cost line. This is to mitigate PR19 overspend for the delivery of a potable water reuse scheme. This proposal is not bringing forward 2025-30 spend but instead conflating its use to address overspend and cost sharing with customers in the previous investment period. We reject this request as this does not meet our criteria.
- Northumbrian Water, Severn Trent and United Utilities requested transition funding for nitrogen technically achievable limit monitoring under the wastewater resilience line for 2023-2024. The requests are not justified by a need to meet statutory WINEP actions and therefore do not meet our criteria for transition funding in 2023-2024. We have assessed the requests as part of our cost assessment process and set the allowances to year 2024-25.
- Northumbrian Water request for transition funding under growth at sewage treatment works for year 2023-24 as this is driven by forecasted exceedance of Dry Weather Flow permit conditions and is not part of the WINEP/NEP programme. We have assessed the requests as part of our cost assessment process and set the allowances to year 2024-25.
- Severn Trent request for transition funding as part of their storm overflow programme for improvements to reduce spills at AMP9+ WINEP sites. This request falls beyond AMP8 investment needs and therefore does not meet our criteria for transition funding. We have assessed the requests as part of our cost assessment process and set the allowances to start in year 2025-26.

We have reviewed Southern Water request for transition funding under the water resilience line for the upgrade of five water treatment works and one water reuse scheme. We rejected transitional cost requests for three of the resilience schemes where we had concerns these were for activities that had already been funded in previous price controls. We have allowed some transitional funding in 2024-25 to support the early planning of new development work and to provide upfront funding for schemes (two resilience treatment works and one water reuse scheme) that fall under our large scheme gated process.

At final determination, we accept the other transition expenditure requests from the companies. Where companies submitted inefficient costs when assessed against our benchmark or have not provided sufficient and convincing evidence against our assessment criteria, they received an allowance of less than requested.

Our final determination

For final determination, we have allowed a total of £183 million of transition funding in years 2023-24 and 2024-25 across water lines and £627 million of transition funding in years 2023-24 and 2024-25 across wastewater lines.

Most of this funding is allowed for early expenditure associated to the WINEP/NEP program as well as actions to be delivered under the companies' latest Water Resources Management Plans WRMP24 or other Drinking Water Inspectorate legal instruments.

Table 37: Transition expenditure allowances

Company	Total water allowance (£ million)	Total wastewater allowance (£ million)	Total allowance (£ million)
Anglian Water	16.65	29.08	45.72
Dŵr Cymru	0.00	0.00	0.00
Hafren Dyfrdwy	0.00	0.00	0.00
Northumbrian Water	6.73	70.43	77.16
Severn Trent Water	77.47	197.83	275.29
South West Water	0.00	74.15	74.15
Southern Water	31.52	26.84	58.36
Thames Water	0.00	0.00	0.00
United Utilities	23.14	124.19	147.32
Wessex Water	2.67	58.14	60.80
Yorkshire Water	15.30	46.39	61.69
Affinity Water	7.24	0.00	7.24
Bristol Water	0.00	0.00	0.00
Portsmouth Water	1.26	0.00	1.26
South East Water	0.86	0.00	0.86
South Staffs Water	0.23	0.00	0.23
SES Water	0.00	0.00	0.00
Total	183.06	627.04	810.10

4.5 Our approach to splitting totex allowances into opex and capex allowances

What we said in our draft determinations

Companies proposed pay as you go rates based on their underlying split of opex and capex before any adjustments for financeability in their business plans. To maintain companies' approaches to cost recovery, we need a similar split of totex to work out pay as you go rates based on our totex allowance.

For draft determinations we calculated companies' proportions of opex and capex on base and enhancement separately. We applied company proportions of opex and capex for base and enhancement expenditure in business plans to our base and enhancement expenditure allowances. We made adjustments for costs that are specifically opex or capex, such as third-party, diversions and developer services costs.

Stakeholders' representations

We received three representations on our approach to splitting our allowances between opex and capex.

Anglian Water identified that a risk may materialise where our approach to shallow and deep dive assessments may disallow costs that are specifically opex or capex which then leads to a misallocation when original ratios are used to split allowances.

Wessex Water suggested that if further efficiency challenges are applied at final determinations then we should consider how they are interpreted to ensure its plan remains financeable. It considered that enhancement efficiency challenges should be applied at the pay as you go (PAYG) rate for that specific activity.

Yorkshire Water also argued that our approach did not account for where efficiencies had been applied leading to a different balance of opex and capex to those needed. This leads to changes in timing of when the funding for the expenditure will be received.

Our assessment and reasons

It would not be proportionate to split totex allowances into opex and capex at a more granular level (for example by enhancement area). This would not have a material impact on the opex and capex split but would add significant complexity to the process.

We have considered our opex and capex allowances alongside those put forward by companies in their draft determination representations as part of our financeability assessment. Financeability is discussed in 'PR24 final determinations: Aligning risk and return appendix'.

Our final determination

We maintain our approach to splitting allowances between opex and capex at final determinations. We have reflected companies' updates to requested costs in draft determination representations when splitting allowances between opex and capex. We have also included schemes that were submitted for consideration under direct procurement for customers schemes but that we assessed as enhancement.

We continue to make adjustments for costs that are specifically opex or capex, such as third-party, diversions and developer services costs.

4.6 Major projects – separate price controls and direct procurement for customers

We set separate controls which are company specific for two major projects:

- Tideway wastewater control for Thames Water only; and
- Havant Thicket water control for Portsmouth Water only.

Beyond the schemes covered by the strategic resource option allowances for large water resource schemes progressing through the RAPID process, we also provide separate allowances for the development of other direct procurement for customers (DPC) schemes. We set out our approach and proposed allowances below.

4.6.1 Thames Tideway Tunnel

The Thames Tideway Tunnel is the main component of a solution to reduce overflows of untreated sewage into the tidal River Thames in order to achieve compliance with the Urban Wastewater Treatment Directive. The tunnel is being delivered by Bazalgette Tunnel Limited ("Tideway"), a third-party infrastructure provider. The project has largely completed the construction phase and has just begun the commissioning phase. It is expected to be fully operational by late 2026.

Thames Water has an important role on the project during both the construction and commissioning phases as well as future responsibility for the tunnel's operation. This includes disposing of surplus land after construction activities have finished. Thames Water has a separate price control for its activities related to the Thames Tideway Tunnel.

Table 38: Totex expenditure for Thames Tideway, 2025-30 (£ million, 2022-23 CPIH deflated prices)

Service	Business Plan Company view	Draft determination allowance	Draft determination company representation	Final Determination allowance
Costs	179.1	105.8	130.4	119.8
Land sales	-94.6	-121.6	-79.3	-79.3
Total	84.5	-15.8	51.1	40.5

We assess Thames Water's costs associated with the system commissioning and system operation of the tunnel as well as the additional income available from the sale of land associated with the tunnel.

At draft determination, we considered that the costs associated with the commissioning and operation of the tunnel are likely to be lower than the company presents. In particular, we did not allow the full costs for the proposed Enhancement Programme for Smart Networks and Advanced Sewerage Control Systems but made an allowance for preliminary studies including instrumentation and modelling work in 2026-30 that may justify further expenditure beyond 2030.

On land, we recognised that the property market in London is less buoyant than before the pandemic and this has affected the value of the land for disposal. We have made specific adjustments where disposal values are known and for the costs of compensation claims.

Thames Water in its representations clarified the position for two particular sites for disposal and also identified a price base error in presenting land sales in its Business Plan. We accepted these which reduced land sales assumed in the draft determination by £42m.

Thames Water in its representations also explained adjustments made in its Business Plan and later in its April 2024 submission on operating and capital costs which we had not allowed in our draft determinations. These amounted to £23.0m. We accepted these in the final determination but have reduced the expenditure proposed for the costs of the new control room and the additional pump redundancy at Beckton wastewater treatment works. These amounted to £5.5m, giving a net change of £17.5m.

Thames Water accepted our approach to the proposed Enhancement Programme for Smart Networks and Advanced Sewerage Control Systems in its representations. However, it considered that any deferral of completion of the Tideway Tunnel project will limit opportunity to change the operating regime for the London Tideway Tunnels in 2025-30. To mitigate this risk, Thames Water proposed a mechanism for staged funding during 2025-30 should viable options be identified. The mechanism would only release further funding mid-period once the results of the strategic study proved the need for the enhancement and clear parameters were met. We consider that the results of the strategic study will not be known

until towards the end of the 2025–30 period and so could, if necessary, be taken into account in the price review in 2029. For this reason, we have not accepted this proposal.

4.6.2 Havant Thicket reservoir

What we said in our draft determinations

The Havant Thicket reservoir is being delivered by Portsmouth Water for the benefit of Southern Water's customers who will pay for it.

In our draft determinations, we set out that the scope of the Havant Thicket reservoir project was expanding to allow the project to interface with Southern Water's Hampshire Water Transfer and Water Recycling (HWTWR) DPC project. We set out that substantive 'alignment works' were needed to facilitate optimal delivery of Southern Water's HWTWR DPC project including the development of a combined tunnel approach to accommodate two pipelines.

Overall, our draft determination proposed to allow for the additional scope and costs for the alignment works via a second cost adjustment mechanism (CAM2). We indicated that the timing of the cost adjustment mechanism was subject to the outcome of the planning process associated with the pipeline changes; we set out that we expected the CAM2 and planning processes to conclude in 2024. And, that we would amend the scope of the Havant Thicket price control within the PR19 final determination notice.²⁰²

Stakeholders' representations

Portsmouth Water propose the reintroduction of an interim determination of K (IDoK) clause for Havant Thicket with a notified item due to scope changes to allow cost allowances in the 2025–30 period following the cost adjustment mechanism.

Our assessment and reasons

Southern Water may apply for an IDoK if it meets the relevant threshold requirements. For that purpose, we have determined a Notified Item as set out in section 5 ('Uncertainty mechanisms') of 'PR24 final determinations: Major projects development and delivery appendix'.

Our final determination

²⁰² Ofwat, [PR19 final determinations. Notification of the PR19 final determination of Price Controls for Portsmouth Water](#), December 2019.

Effective from 1 November 2024 we amended the scope of the 'Havant Thicket Activities' at Portsmouth Water's request (and with the agreement of Southern Water).²⁰³ The changes made were to account for the necessary interface works with the HWTWR DPC project.

The planning process and the CAM2 application from Portsmouth Water have, however, been postponed until the 2025–30 period as design work is being finalised and the costs independently assured. Please see 'PR24 final determinations: Major projects development and delivery appendix' for more detail on our approach to the CAM2 process.

4.6.3 Allowances for Major projects

In our draft determinations, we set out our overall approach to determining allowances to fund the efficient development costs for projects falling within the 2025–30 period. For all major projects we set allowances for the pre-construction development which comprises:

Project development costs – which includes design costs, costs to obtain the necessary planning consents to deliver the project. We also included allowances for acquiring land rights necessary for the project to be delivered, delivering any site enabling works (where relevant) and delivering any interface works to be completed in the 2025–30 period; and

Cost of developing the project for competitive delivery – DPC-related costs, where appropriate, including costs of developing the project for delivery via DPC, running the procurement process for DPC and managing the CAP Agreement. Where projects are likely to be delivered via SIPR we have allowed for the costs of developing the project via SIPR.

In general, the costs of detailed design, building, financing, operating and maintaining a DPC-delivered project will not be included within the price review, as those costs will be set via the competitive process and recovered from customers via an Allowed Revenue Direction (ARD) issued by Ofwat under Condition U of companies' licences.

Full details of stakeholders representations, our assessment and final determination are set out in 'PR24 final determinations: Major projects development and delivery appendix'.

4.7 Dealing with uncertainty

In a price control we set efficient expenditure allowances in advance of the year the costs will be incurred. There are always uncertainties about the future, and therefore a risk that we set an allowance that is too low or too high.

In section 4.1 we discussed the use of real price effect ex-post true-ups for labour (base and enhancement), energy (wholesale base) and materials, plant and equipment (enhancement)

²⁰³ Ofwat, [Update to Havant Thicket Activities and statement of reasons for changes](#), 1 November 2024

to address the risk that real input prices are higher or lower than forecast, and/or increase at a slower or faster rate than general inflation (CPIH).

This section discusses other mechanisms we use to manage cost and output uncertainty. This could be caused by actual input prices being different to what we assumed at the price review, or water companies delivering different outputs (quantity or quality) to what we assumed at the price review. These mechanisms mean that customers only pay for outputs that are delivered by the water company and incentivise water companies to deliver water and wastewater services efficiently.

The remainder of this section includes:

- cost sharing;
- price control deliverables;
- approach to large schemes;
- delivery mechanism;
- storm overflows uncertainty mechanism;
- third-party services reconciliation mechanism;
- PFAS Targeted Reassessment Mechanism (PFAS TRM)
- future cyber wastewater amendments and re-assessment of threat levels; and
- bespoke cost uncertainty mechanisms.

4.7.1 Cost sharing

Cost sharing shares cost risk between companies and customers. It allows us to rely less on other uncertainty mechanisms such as interim determinations, which leads to a lower regulatory burden, and incentivises companies to deliver water and wastewater services efficiently.

Cost sharing refers to the policy treatment of overspend or underspend against efficient cost allowances we set for water companies:

- the cost sharing rate on overspend captures the share of overspend that the company needs to bear; and
- the cost sharing rate on underspend captures the share of underspend that the company gets to keep.

For example, 40:60 (overspend : underspend) cost sharing rates means:

- the company bears 40% of any overspend and the other 60% is borne by customers and
- the company keeps 60% of any underspend with the other 40% transferred to customers.

- Cost sharing rates can be asymmetric with a different rate for overspend and underspend.²⁰⁴

As set out in the PR24 methodology, cost sharing achieves multiple regulatory objectives.²⁰⁵ Firstly, it addresses information asymmetry between us and water companies by helping to reveal efficient costs:

- **ex ante** – it aimed to incentivise water companies to reveal efficient costs in their PR24 business plans in exchange for receiving more favourable cost sharing rates. This helps us to set a more stretching cost benchmark to the rest of the sector, leading to lower water bills.
- **ex post** – once the price control period starts, the company has an incentive to reveal its efficient cost and gain a share of its outperformance. The outcome reduces current price control period costs by sharing part of the underspend with customers, and also reduces costs at future price reviews as outturn data can be used to help set future efficient expenditure allowances.

Cost sharing allows for the inherent cost forecasting risk to be shared between customers and companies. By sharing the burden of overspend risks that companies face within the control period, cost sharing acts to reduce the level of risk that companies price into their business plans every five years and encourages them to respond effectively to unforeseen events. Therefore, cost sharing results in effective risk sharing that can reduce costs for customers.

Cost sharing is applied to gross totex (ie before deducting developer services revenue) but with certain costs removed from totex:

- all costs included in the PR24 third-party services reconciliation mechanism – price control third-party services, water section 185 diversions, and water and wastewater non-section 185 diversions;
- non-price control third-party and developer services expenditure;
- equity issuance costs;
- pension deficit recovery costs;
- expenditure on projects funded by the innovation and water efficiency funds;

²⁰⁴ Throughout this section we refer to cost sharing rates in the following format (x:y) where 'x' captures the proportion of any overspend compared to PR24 cost allowances borne by the company and 'y' captures the proportion of any underspend compared to PR24 cost allowances retained by the company.

²⁰⁵ [PR24_final_methodology_Appendix_9_Setting_Expenditure-Allowances.pdf \(ofwat.gov.uk\)](#) (p.40)

- disallowable costs, including costs associated with impairment of other businesses; costs relating to financing (bond issuance fees, refinancing, takeover costs); fines and investigation costs; compensation claims and guaranteed standards scheme (GSS) payments; and other costs where the activity driving it does not have a reasonable expectation of customer benefit; and
- financial consequences resulting from price control deliverable time incentives (see section 4.7.2 below for more details)

What we said in our draft determinations

Cost sharing rates based on our business plan quality and ambition assessment

We varied cost sharing rates for base expenditure allowances based on our assessment of business plan quality and ambition (QAA) with high quality business plans getting more favourable rates. This was based on policy set out in the PR24 methodology.

Use of lower cost sharing rates for enhancement expenditure

We proposed to set lower cost sharing rates of 40:40 for enhancement expenditure. These are close to cost sharing rates that apply to base expenditure, which helps to mitigate the risk of perverse incentives (ie influencing cost allocation between base and enhancement), while recognising the potentially lower certainty of enhancement costs and upcoming challenges for the sector to deliver the large PR24 enhancement programme. We proposed not to vary the rates depending on the outcome of the QAA assessment to avoid complexity.

In addition, we proposed to set even lower cost sharing rates of 25:25 for three enhancement expenditure areas where there is potentially higher uncertainty:

- IED enhancement expenditure – due to uncertainty and the potential scale of costs related to IED requirements and consistency with the CMA PR19 redetermination decision which set 25:25 cost sharing rates for Northumbrian Water and Yorkshire Water;
- large non-complex schemes with a request of higher than £100 million that fall under our enhanced engagement and cost sharing option (see below for more detail); and
- strategic regional options contingent funding.

Bioresources cost sharing

For draft determinations, we proposed to align bioresources cost sharing rates with wastewater network plus. Base expenditure would be subject to cost sharing of up to 50:50 (dependent on the QAA outcome) and enhancement expenditure would be subject to 40:40 rates (except for IED enhancement expenditure where rates were set at 25:25).

Business rates

We proposed to apply 10:10 cost sharing rates due to enhanced uncertainty in how business rates will change over the 2025–30 period.

In August 2024 we published a draft cost reconciliation model.

Stakeholders' representations

Representations on our draft determinations were broadly supportive of our approach to cost sharing.

Most companies were supportive of the lower cost sharing rates for enhancement costs²⁰⁶. Wessex Water suggests that while it mitigated some downward skew it would be better to address these risks at source. Portsmouth Water does not support the differential cost sharing rates for base and enhancement without the ability to trade off over and underspends within the overall package.

Anglian Water put forward three more areas that should be subject to 25:25 costs sharing rates – interconnectors, continuous water quality monitoring and compliance with waste permitting regulations in bioresources. Severn Trent Water and Yorkshire Water agree that lower cost sharing rates should be extended to all waste permitting costs.

Thames Water welcomes the introduction of cost sharing to the bioresources price control. It is generally supportive of lower cost sharing rates in areas of greatest uncertainty but does not agree with the asymmetric cost sharing rates for companies that were rated inadequate in the quality and ambition assessment (QAA).

Several companies noted that the PR24 cost sharing reconciliation will be more complex than PR19 and support further engagement through a formal reconciliation rulebook consultation.

Our final determination

Cost sharing rates based on our business plan quality and ambition assessment

We discuss our final determinations decisions on the business plan quality and ambition assessment (QAA) in our document 'PR24 final determinations: Quality and ambition assessment summary'. The table below sets out the outcome of our QAA assessment and the resulting cost sharing rates. These mostly apply to wholesale base expenditure allowances.

²⁰⁶ Anglian Water, Dŵr Cymru, Hafren Dyfrydwy, Severn Trent Water, South West Water, Southern Water, United Utilities, Yorkshire Water, Affinity Water, South East Water and SES Water

Table 39: PR24 QAA assessment rating and base expenditure cost sharing rates

Company	Categorisation of business plan	Cost sharing rate
Severn Trent Water	Outstanding	50:50
South West Water	Outstanding	50:50
Anglian Water	Standard (no intervention)	50:50
Hafren Dyfrdwy	Standard (no intervention)	50:50
Northumbrian Water	Standard (no intervention)	50:50
United Utilities	Standard (no intervention)	50:50
Yorkshire Water	Standard (no intervention)	50:50
Affinity Water	Standard (no intervention)	50:50
Portsmouth Water	Standard (no intervention)	50:50
SES Water	Standard (no intervention)	50:50
Dŵr Cymru	Standard (intervention)	50:50
South Staffs Water	Standard (intervention)	50:50
South East Water	Conditions met at FD	50:50
Southern Water	Conditions met at FD	50:50
Wessex Water	Conditions met at FD	50:50
Thames Water	Inadequate	60:40 ²⁰⁷

Enhancement cost sharing rates

For final determinations, we retain cost sharing rates of 40:40 for enhancement expenditure. In addition, we set lower cost sharing rates for enhancement expenditure areas where there is potentially higher uncertainty.

- We set 25:25 cost sharing rates for IED enhancement expenditure, environmental permitting regulation (EPR) permits, schemes included in enhanced engagement and the large scheme gated process.
- We set 40:10 cost sharing rates for continuous water quality monitoring and investigations.

We disagree that Anglian Water's interconnectors programme should have enhanced 25:25 cost sharing rates. Two out of seven of Anglian Water's interconnector schemes are included in enhanced engagement process are subject to 25:25 cost sharing rates. The other schemes are not sufficiently material or uncertain to justify 25:25 cost sharing rates.

In section 3.6.3 we discuss our approach to setting allowances for Strategic Resource Options (SROs) and associated cost sharing mechanism. For final determinations we are introducing

²⁰⁷ As Thames Water is subject to our Turnaround Oversight Regime (TOR), we are providing the company with an opportunity to earn its PR24 QAA penalty back at PR29 if it demonstrates sufficient improvement within this regime. If the company makes sufficient progress under the TOR, we will reverse its financial penalty and apply standard 50:50 cost sharing rates on its base expenditure.

a 'use it or lose it' approach where we will return to customers any underspend of allowances at PR29.

Continuous river water quality monitoring

Continuous river water quality monitoring is relatively new to the water sector. As a result, confidence in outturn costs is limited, and there is the potential for rapid innovation leading to significant cost reductions. We have provided the sector with an allowance that is in line with requested costs and is sufficient to deliver this new programme of work. But we recognise that options for lower cost monitors may emerge in the short term, given the large quantity of monitors required.

For final determination we are introducing 40:10 cost sharing rates so that customers do not overpay should there be significant outperformance due to a new and rapidly evolving market, particularly given the range of installation types available for companies to use. This means that companies can recover 60 percent of any overspend from customers. And 90 percent of any underspend against the allowance will be returned to customers.

Investigations

One of the main drivers of investigations costs is complexity, with complex investigations costing six times simple investigations. We have had ongoing discussions with the Environment Agency and companies over the proportion of investigations that would be complex. While some companies made reasonable estimates of the percentage of investigations likely to be within lower complexity categories, others maintained that all investigations would be complex. The Environment Agency is also unable to confirm what proportion of investigations will be complex. As a result, we have concerns that some customers could significantly overpay for investigations, but this will not be known until investigations are delivered.

For final determinations, we are introducing 40:10 cost sharing rates so that customers do not overpay should there be significant outperformance due to less complex investigations than forecast being delivered. This means that companies bear 40 percent of any overspend, and 90 percent of any underspend will be returned to customers.

IED and EPR for sludge-to-land

We have had ongoing discussions with the Environment Agency and water companies related to the compliance requirements under the IED. We understand from the Environment Agency that the permitting process is progressing, and it aims to have most permits in place as soon as practicably possible (subject to the quality of the applications received). We have concerns that some customers could overpay for costs associated with IED should companies optimise and reduce the scope. Conversely, as IED permits are still to be issued for a number of sites, we risk underfunding companies for their IED compliance obligations should the

scope increase as a result of permit requirements. On this basis, we retain 25:25 cost sharing rates for IED costs.

Anglian Water and United Utilities requested costs in their representations under Environmental Permitting Regulations (EPR) for sludge-to-land management activities, i.e. the permit costs²⁰⁸ associated to enable recycling of sludge to agriculture in compliance with EPR. If EPR requirements for sludge to-land activities materialise, all companies carrying out these types of activities will be required to comply. However, the Environment Agency has not confirmed the specific date for the transition of sludge and septic tank sludge into the EPR and some companies have not requested funding at PR24. For final determinations we are introducing 25:25 cost sharing rates so that customers do not overpay should the costs not materialise during 2025–30, and to manage the risk for those companies that did not request funding should they incur costs. Anglian Water, Wessex Water, Severn Trent Water, and Yorkshire Water proposed this in draft determination representations.

Bioresources

For bioresources, we retain our draft determination position and align bioresources cost sharing rates with wastewater network plus. Base expenditure is subject to cost sharing of up to 50:50 (dependent on the QAA outcome) and enhancement expenditure subject to 40:40 rates (except for IED enhancement expenditure and EPR for land application, where rates are set at 25:25).

Business rates

Section 2.3.1 sets out our final determinations decisions in relation to business rates. We will apply 10:10 cost sharing rates due to enhanced uncertainty in how business rates will change over the 2025–30 period. These rates should also retain some incentive for companies to try and minimise increases in business rates in the 2025–30 period, and subsequently minimise the impact of increases in business rates on water bills.

Abstraction charges and discharge consents

Section 2.3.2 sets out our final determinations decisions in relation to abstraction charges and discharge consents. We will apply 25:25 cost sharing rates due to the limited control companies have over these charges.

Cost reconciliation model

We will consult on the application of this reconciliation as part of the PR24 reconciliation rulebook.

²⁰⁸ Proposed actions submitted by Anglian Water and United Utilities' representation [Business plan tables– August 2024 companies' representations, Sludge Treatment Other (WINEP/NEP) bioresources, CWW3.148]

4.7.2 Price control deliverables

Price control deliverables or PCDs will set out the key outcomes or outputs from enhancement and related expenditure. PCDs:

- increase our oversight of delivery through increased reporting and the assurance requirements on what companies are delivering;
- protect customers from companies failing to deliver the funded improvements by returning the funding to customers; and
- incentivise companies to deliver 'on time' by applying underperformance payments where companies deliver late and applying outperformance payments where companies deliver on time.

PCDs are not an entirely new incentive mechanism for Ofwat. We used a form of PCD at PR19 to protect material enhancement investments in areas where there is no regulatory oversight from other regulators, for example on resilience expenditure. In PR19 we referred to these incentives as scheme specific performance commitments. PCDs are also used in other sectors. For example, Ofgem uses PCDs to adjust allowances downwards in response to scale of non-delivery for commercial Electric Vehicle Fleets, Gas Holder demolitions and Cyber resilience.

What we said in our draft determinations

In draft determinations we proposed to introduce two PCD incentives:

- **Non-delivery PCD.** This is a claw-back mechanism that will return funding to customers where companies fail to deliver the stated benefit by the end of the regulatory period. We proposed to apply this incentive to material investments which are not protected by a gated process. This resulted in non-delivery PCDs covering c.75% of enhancement expenditure.
- **Time incentives PCD.** This is a two-way incentive to encourage timely delivery by rewarding on time delivery and penalising late delivery. This incentive is applied in addition to the non-delivery PCD. We set the late delivery underperformance rate at 3.66% (equivalent to the WACC). To balance the risks for companies we proposed to set the 'on time' delivery outperformance rate at one quarter of the late delivery underperformance rate. We proposed to apply this incentive to five areas²⁰⁹ covering c.50% of enhancement expenditure.

We proposed to apply PCDs to material investments defined as 1% or more of the relevant totex (wholesale water totex for water enhancements and wholesale wastewater totex for

²⁰⁹ Storm overflows, phosphorus removal, water supply, metering and mains renewals.

wastewater enhancements). We said we would allow some exceptions to this, for example where there were trials.

We proposed not to net off ODI payments from non-delivery PCD payments so that customers would not lose out from companies not delivering the improvements or delivering them late.

We stated we will apply PCDs and cost sharing sequentially, with PCDs being reconciled first to avoid double counting non- or under-delivery in our totex reconciliation.

Finally, we proposed not to allow changes (other than those allowed within each individual PCD) during the regulatory period, apart in the following cases:

- **Investments which are slightly late but are on track to be delivered early in PR29.** If scheme delivery is late for a few months into the 2030-35 period, we proposed to hold the application of the non-delivery PCD payment.
- **Investments which are no longer in the benefit of customers to be delivered.** We proposed to allow companies to retain 6% of the allowance where they demonstrate that under-delivery is due to an investment no longer being required (in the short term and long-term) and where there are material benefits to customers from stopping the investment.
- **Investments for which funding is not accessed through the delivery mechanism.** We proposed to consider waiving the application of non-delivery PCD payments for schemes which funding is not triggered through the delivery mechanism.

Stakeholders' representations

Stakeholders generally support the introduction of PCDs in PR24. CCW supports the introduction of PCDs as an additional mechanism to protect customer money should companies fail to deliver projects as planned. British Water suggests that companies need to spend money more consistently across the price review period and deliver schemes at greater pace rather than back loading the programmes.

Some stakeholders express concerns in relation to elements of our approach which in their view introduce a negative skew on the balance of risks. The key concerns raised by stakeholders are:

- **Overlap with other incentives.** Some companies²¹⁰ argue that the combination of PCDs, ODIs and possible enforcement action is punitive for companies and that this introduces a negative skew on the balance of risks. United Utilities call for Ofwat to prioritise the use of ODIs over PCDs. Three companies²¹¹ ask for ODI payments to be netted off from PCD payments to remove this overlap. Three companies²¹² argue that time incentive PCDs are

Southern Water, United Utilities, Anglian Water, South East Water, Dŵr Cymru Yorkshire Water and Wessex Water.

²¹¹ Portsmouth Water, Southern Water and South East Water.

²¹² Southern Water, Thames Water and Yorkshire Water.

not needed where statutory obligations apply, as companies already have sufficient incentives to deliver on time in these areas.

- **Asymmetric time incentive PCD rates.** Five companies²¹³ ask for underperformance and outperformance rates for time incentives to be more symmetric. They argue that PR19 delivery is not a good indicator of delivery in PR24 given that PR24 is more complex and larger in scale. Some companies²¹⁴ suggest that a ratio between on time delivery and late delivery of 2:1 or 3:2 (rather than 4:1) would be more appropriate. Severn Trent and United Utilities also calls for Ofwat to reward early delivery (and not just on time delivery).
- **Delivery profiles and PCD targets.** Most companies express concerns on our proposed delivery profiles for storm overflows and phosphorus removal. They ask for company specific circumstances to be reflected, such as size and complexity of the programme, and scheme dependencies (eg, investigations). WaterUK and most companies also challenged the connectivity and data completeness standards we proposed as part of the metering PCD. They consider these standards to be unachievable, lead to higher costs and could hinder vendor choice and innovation.
- **Dealing with change.** There were calls for the PCD regime to allow more flexibility to substitute schemes and change delivery dates. Seven companies²¹⁵ suggest that a change control process should be put in place to allow changes in-period. Severn Trent Water proposes a one-year trial to test a change control process. Some companies²¹⁶ ask for non-delivery PCD payment to not apply to schemes that are late but which will be delivered in the following regulatory period (otherwise companies may not have incentives to deliver them). Four companies²¹⁷ ask for late delivery underperformance payments to not apply where delay is due to factors outside the company's control. Wessex Water calls for companies to be able to retain efficient expenditure where investments are no longer needed (rather than the proposed 6%). The Environment Agency requests more clarity on the alignment between PCDs and WINEP alteration process. Some environmental NGOs ask for PCDs to allow more flexibility to substitute grey solutions with green solutions.

Our assessment and reasons

Materiality testing

We continue to apply PCDs to material investments which are not protected by a gated process. We retain the materiality threshold of 1% of the company's relevant total expenditure. We define relevant total expenditure as total wholesale water totex for water

²¹³ Anglian Water, Hafren Dyfrdwy, Severn Trent, Thames Water and United Utilities.

²¹⁴ Eight companies commissioned a report from KPMG on RoRE risk. The report recommends a payment ratio of 3:2 (on time/late delivery) to reflect the more complex nature of the PR24 programme. This is based on the delivery experience in large scale construction projects in other countries. This suggests that 40% of schemes are likely to be delayed. Severn Trent asked for the outperformance rate to be at least 50% of the late delivery underperformance rate.

²¹⁵ Northumbrian Water, Hafren Dyfrdwy, Severn Trent, South East Water, Southern Water, Thames Water and Wessex Water.

²¹⁶ Anglian Water, Dwr Cymru, Northumbrian Water, South West Water, Southern Water.

²¹⁷ Anglian Water, Dwr Cymru, Thames Water, Yorkshire Water.

enhancements and total wholesale wastewater totex for wastewater enhancements. We calculate threshold using allowed expenditure (pre frontier-shift adjustment).

We apply exceptions to our materiality test. We apply PCDs to investments below the materiality threshold for:

- schemes falling slightly short of the 1% materiality threshold²¹⁸;
- trial schemes (eg A-WINEP) where customers are being asked to fund schemes to test new approaches. We want companies to deliver these schemes so that the sector can learn from these projects;
- carry over schemes (eg PR19 WINEP, Green Recovery, IED and ODI schemes) where companies are forecasting to not deliver schemes by the end of PR19 period and so additional customer protection is required to encourage delivery by the end of PR24 period;
- schemes in areas where we assess costs at the scheme level (eg, storm overflows, phosphorus removal, supply interconnectors). These are some of the largest areas of enhancement expenditure so we want to make sure we apply a consistent approach to customer protection across all companies.
- WINEP investigations due to our concerns that companies have under delivered in PR19; and
- schemes where there is no regulatory oversight other than Ofwat (eg resilience schemes) in which case we may deem a lower materiality threshold appropriate.

Overlap with other incentives

We want companies to have sufficient incentives to deliver the improvements that customers are paying for. In our PR24 methodology we stated that customers should not lose out from companies not delivering the improvements or delivering them late. To achieve this, we expected PCD payments to apply in addition to ODI payments. Where the impact of enhancement expenditure on ODI payments is likely to be material, companies can propose to net off the impact of under- or non-delivery on ODI payments. Where companies propose this however we asked companies to explain how the combination of PCDs, ODIs and cost sharing will more than recover the cost of the enhancement so that companies are worse off if they under-deliver or do not deliver the funded improvement.

We have updated our analysis on the impact of enhancement expenditure on ODI payments to reflect company representations. The non-delivery of enhancement schemes could lead to ODI underperformance payments equivalent to around 1% of the value of expenditure across the whole enhancement programme. This impact is not significant and is lower than at draft determinations due to the reduction in ODI rates at final determinations. The areas where there is some overlap between enhancement expenditure and ODIs are biodiversity and leakage reduction. We are not applying PCDs to leakage reduction activities (other than main

²¹⁸ We do not consider that these investments are materially different to those that just meet the materiality threshold.

renewals). There is a smaller overlap in areas such as water efficiency, metering and storm overflow. We expect delivery of these programmes to be largely within the company's control, so we do not consider this overlap to introduce a negative skew on the balance of risks. We therefore retain our draft determination proposal to not allow ODI payments to be netted off from PCD payments. This is consistent with our policy objective to make sure companies have sufficient incentives to deliver.

We also retain our draft determination proposal to PCD payments and cost sharing sequentially. We will apply PCD payments first. We will then adjust baseline allowances by any non-delivery PCD payments before applying cost sharing. We are publishing a draft PCD reconciliation model (PR24CA153) alongside our final determination. We welcome views from stakeholders on this model by 14 February 2025. We will publish a final PCD reconciliation model in Spring 2025.

Time incentive PCDs

We have considered whether to reward early delivery as well as on time delivery.

Rewarding early delivery could lead to unintended effects. Rewarding early delivery could favour traditional solutions over nature-based solutions. Companies are more experienced in delivering traditional solutions and claim that traditional solutions are likely to be quicker to deliver than nature-based solutions.²¹⁹ While we want to encourage early delivery, we do not want this to be at the expense of companies being less ambitious in the use of nature-based solutions. Therefore, we are retaining our draft determination proposal to reward on time delivery and not early delivery.

We are resetting late delivery incentives so that they are three times the rate of on time incentives. In draft determinations we set late delivery incentives at four times the rate of on time delivery incentives. This reflected the relative proportions of late and on time delivery of enhancement projects based on PR19 WINEP delivery data. PR19 delivery is likely to provide a good indication of how often companies are likely to deliver late in PR24. The activities that tracked by time incentives (metering, storm tanks, phosphorus removal and interconnectors) are similar to those delivered by companies in PR19 WINEP, in that they reflect large programmes of similar work. These are different to those examined by the KPMG report which examined large projects in different sectors across 11 countries.²²⁰ Although the PR24 programme will be bigger in scale and more complex than PR19, there are offsetting factors, such as COVID impact and the lack of financial incentives for timely delivery in PR19²²¹, which are likely to make delivery in PR19 more comparable to PR24. We have

²¹⁹ Stakeholders have argued in their representations that delivering nature-based solutions take longer to deliver than traditional grey solutions.

²²⁰ The KPMG report looks at 57 projects across 11 countries. Of these 57 projects, 12 focus on the water sector. The rest draw upon infrastructure projects carried out in the rail, road and aviation industry (among others).

²²¹ For example, companies that had a financial performance commitment in relation to their WINEP programme in PR19 delivered WINEP schemes to schedule more often than companies with no financial performance commitment.

therefore retained our draft determination proposal to inform the ratio between on time delivery and late delivery using PR19 delivery data.

We have undertaken further work to assess the proportion of enhancement projects that are delivered late by examining the latest PR19 WINEP delivery data. We find that companies deliver 76% of schemes on time.²²² This suggests the ratio between on time delivery and late delivery is closer to three to one. We have verified the robustness of this estimate against WRMP delivery data. We find that on time delivery was less frequent for metering (64%) but this was in the context of COVID causing delays in the delivery of the metering programme. For water supply schemes we find that on time delivery was more frequent at (78%). We therefore consider that a three to one ratio between on time delivery and late delivery is a reasonable assumption to make across the areas where we apply time incentive PCDs. This means that late delivery incentives will be three times the on time incentive rate.

Delivery profiles and PCD targets

We want companies to install high quality meters and deliver the benefits from smart metering that customers are paying for. We have undertaken further work to assess feasible levels of connectivity to address company concerns. We understand that companies are testing different technologies, and rollout approaches to maximise the benefits of smart meters while keeping the costs low. We want to set targets that are achievable and deliver the benefits promised to customers. We understand that lower standards can still deliver the desired benefits. Unlocking these benefits will require companies testing and learning during this review period. Therefore we are reducing the connectivity and data completeness standards we expect companies to achieve in their smart meter rollouts in PR24. These are minimum standards we expect companies to achieve over the next five years. We expect companies to build on their experience in this control period and achieve higher standards in future periods. We set out further details on this decision in 'PR24 final determinations: Price control deliverables appendix'.

We propose to alter the delivery profile for storm overflows and phosphorus removal programmes. On storm overflows and phosphorus removal companies challenged our proposed delivery profile for PCDs. In business plans most companies proposed a delivery profile that was back end loaded. The supply chain has repeatedly voiced concerns over the back end delivery profile of water companies and the impact that this has on costs and delivery. In draft determinations we proposed a delivery profile that was more evenly spread across the period and better reflected the expenditure profile proposed by companies. In their representations most companies challenged this delivery profile. On storm overflows companies mentioned that the reasons for why they cannot deliver the storage faster include the complexity of the programme, many schemes being dependent on investigations (which will not be all completed until 2027) and the additional time taken to deliver nature-based

²²² We define 'on time' delivery as a scheme being delivered by the financial year when the regulatory date falls into. This is consistent with the incentive structure we are proposing to apply for time incentives PCDs in PR24.

solutions. Four companies broadly matched our proposed delivery profile in their representations suggesting that this profile may be achievable.

For our final determination we continue to challenge companies on the pace of delivery of their storm overflow and phosphorus removal programmes. For storm overflows, we are retaining our draft determinations profile for the first three years of the period but propose to reduce the target in year four. Companies should have already completed some of the investigations in PR19 which should allow them to deliver some schemes early in the period. The revised target for year four will provide companies with further flexibility to deliver green storage solutions towards the end of the period. For phosphorus removal schemes, we are applying a less restrictive profile for the first three years of the regulatory period to reflect the additional complexity of delivering these schemes. Further details are set out in 'PR24 final determinations: Price control deliverables appendix'.

Dealing with change

We want to support companies to maximise their delivery of nature-based solutions.

To encourage this, where possible, we have set PCDs based on generic outputs rather than specific solutions. For example, in storm overflows, we proposed to track delivery of equivalent storage. Equivalent storage can be delivered through grey, green or hybrid (mixed grey and green) solutions. This allows company's flexibility to swap between grey and grey-green hybrid solutions. In draft determinations we proposed to limit substitutions from and to green solutions. Green solutions can be more expensive than grey or grey-green hybrid solutions as they can require significantly more land or more expensive design to deliver the required volume of water. In PR24 draft determinations we proposed to fund these solutions at three times the unit cost rate of grey and grey-green hybrid solutions. Green solutions account for a small fraction of the overall storm overflow programme.

We understand that companies and relevant regulators are still assessing the extent to which green solutions will deliver the required benefits for the environment. For final determinations we will therefore allow companies to substitute to grey or grey-green hybrid solutions if green solutions cannot be delivered. To protect customers from companies switching to a cheaper solution (and keeping the resulting cost savings) we will claw-back the additional cost allowance provided for the substituted green solution. We will also allow substitution from grey or grey-green hybrid to green solutions if this is agreed with the Environment Agency or Natural Resources Wales.

We want companies to deliver the benefits in a timely manner. Customers have paid for the delivery of these benefits and so we expect companies to deliver these benefits in line with the profile of funding. We will therefore not allow PCDs to change in period to reflect changes that may be agreed between companies and relevant regulatory authorities in relation to delivery dates, for example through the WINEP/NEP alterations process. Therefore we will keep the application of PCDs separate from the WINEP/NEP alterations process. This

extends to areas where we require sign-off from a relevant authority to demonstrate delivery (eg, water quality, WINEP investigations, PR19 WINEP carryovers).

We are setting time incentive PCDs at the programme level so we expect companies will be able to manage changes in statutory dates across the relevant programmes. We are conscious that we are applying time incentive PCDs in some areas where companies may have few schemes to manage delivery risks across. This is the case of water supply, supply interconnectors and resilience interconnector schemes. To enable companies to manage delivery risks we are allowing a one year grace period before time incentive underperformance rates start to apply in these three areas.

We will continue to allow companies to request a waiver on the application of non-delivery PCD payments where the company has not delivered the benefit by the end of the control period but is on track to deliver the benefit within few months from the start of PR29. This is to not discourage companies from getting on with delivering the investment if they are still on track to deliver this within a few months into the next control period. Where we accept these requests, and to discourage companies from delaying delivery further, we will apply late delivery penalties from 1 April 2030. These late delivery penalties will accrue on a monthly basis up to a maximum of 5 years. We reserve the right to apply the non-delivery PCD payment if the company fails to deliver the benefit by the end of PR29.

We will allow companies to retain 6% of the allowance, to cover development costs, where they demonstrate that under-delivery is due to an investment no longer being required (in the short term and long-term) and where there are material benefits to customers from stopping the investment. This is in line with our view of efficient development costs that we allow in other areas of our assessment, for example in relation to strategic resource options. Therefore this is consistent with Wessex Water's ask to allow companies retaining efficient costs. To avoid distracting companies from delivering their programme, we will only allow companies to retain the 6% allowance where the cost savings to customers from doing this are material at 1% of the relevant wholesale totex. We consider this may only apply to selected areas for example, we would not expect this to apply to base expenditure or storm overflow schemes. We will set out further guidance in due course.

Our final determination

We are retaining the application of PCDs to around 80% of the allowed enhancement expenditure. We are also retaining the application of time incentive PCDs to around 50% of the enhancement expenditure.

To address the concerns raised by stakeholders on the potential impact of PCDs on the balance of risks we are applying the following key changes to our PCD framework:

- **Increase reward for on-time delivery** by adjusting time incentive PCD rates so that on time delivery rates are a third rather than a quarter of late delivery incentives. This is to

better reflect the latest PR19 delivery data. We also update the late delivery underperformance rate to reflect the WACC level in our final determination;

- **Allow further flexibility** for companies to substitute between grey and green solutions to support companies going beyond their business plan and deliver more nature-based solutions;
- **Allow a one year grace period** before time incentive underperformance rates start to apply in the areas of water supply, supply interconnectors and resilience interconnector schemes;
- **Reduce connectivity standards** for smart meters to allow companies to learn and test different technologies and rollout approaches in the initial years of the period; and
- **Set a less restrictive delivery profile** for storm overflows and phosphorus removal schemes to support the delivery of more nature-based solutions.

We are also making changes to the way that time incentive PCDs apply where companies fail to deliver an investment and do not plan to deliver this investment in the next period. Where this happens and to strengthen the incentives to deliver, we will apply time incentive penalties equivalent to 5 years. This is unless the company can demonstrate that the investment is no longer required both in the short and longer term. If the company does not deliver the investment by the end of PR24 but needs to deliver it in the following period we will apply late delivery penalties (on a monthly basis) up to a maximum of 5 years. This is in all areas where we apply non-delivery PCDs.

PCDs will add complexity to our regulatory framework and will have resource implications for companies and Ofwat. This added complexity is proportionate and targeted given the significant step up in investment in PR24 compared to previous price reviews. The additional costs of the PCD regime will be small compared to the £44 billion size enhancement programme. PCDs will allow us to protect the interests of customers and wider stakeholders.

To reduce the risk of unintended consequences our approach will allow companies some degree of flexibility by:

- Setting PCDs at the programme level rather than at a scheme level. This means that we have grouped scheme outputs into themes of expenditure, eg, water supply, storm overflows, phosphorus removal. Setting PCDs at the programme/theme level will allow companies to manage delivery risks across a portfolio of projects while protecting customers from companies not delivering the funded improvements.
- Using end of period incentives which means that revenues are not adjusted until the end of the period. By comparison 'in period' incentives are reconciled each year, as happens with 'In Period' outcome delivery incentives. This allows companies time to catch up with programmes over the period. We intend to monitor progress on delivery every year through company Annual Performance Reports.
- Designing time incentive PCDs such that companies do not face underperformance payments as long as they deliver 75% of the benefit to schedule. We have also allowed a

one year grace period in areas where time incentive PCDs apply to a small pool of schemes.²²³

4.7.3 Approach to large schemes

What we said in our draft determinations

Given the uncertainty that can arise in the delivery of large schemes, at draft determination we applied an alternative approach to providing allowances for large enhancement schemes. This approach will apply when an enhancement scheme's requested value is greater than £100 million and where we have concerns around scope, cost, deliverability, complexity or if schemes involve novel elements or complex technologies. The scope and costs of large schemes can often change and significantly increase as the schemes are developed and delivered. The aim of adopting an alternative approach to providing enhancement allowances is to protect customers and companies from final scheme costs being very different to the costs requested in business plans and to give the best chance for schemes to be delivered to achieve the desired outcomes.

We adopted two approaches, these were:

- **Enhanced engagement and cost sharing** – this is a lighter touch approach for schemes where we primarily had concerns around cost
- **Large schemes gated approach** – this is a full gated approach for schemes where we had significant concerns around scope, cost, complexity or it is novel.

Enhanced engagement and cost sharing

Enhanced engagement and cost sharing should incentivise companies to deliver the proposed schemes and outcomes at an efficient cost but protect customers and companies if the costs are significant different to forecast. We proposed 25:25 cost sharing rates for these schemes. This means that companies will bear 25% of the cost of any overspend and retain 25% of the benefit from any underspend. This should retain incentives for companies to be efficient.

We expected regular engagement with us (quarterly) with a submission of the scheme development and progress on 3 November 2025 and 4 May 2026. These submissions would include evidence of the activities (such as feasibility, scoping, design and costing) as expected for the formal gated process. The company will be expected to engage with other regulators (eg DWI and Environment Agency) as necessary through the development and delivery of these schemes. These will not be formal decision points with the company

²²³ Water supply, supply interconnector and resilience interconnectors.

responsible for the scoping, design and delivery of the scheme based on the efficient allowances determined at the price review.

Large schemes gated approach

Our approach provided development allowances for all schemes with stage gates to ensure that companies have made appropriate decisions to deliver the required outcomes. The approach is similar to the gated process overseen by RAPID since 2020, but with changes to ensure that the large schemes gated process is proportionate to the scale and complexity of the projects identified and their timetable for delivery. Unlike most of the RAPID strategic resource options (SROs), these large schemes are expected to be delivered in-house and as such the process will determine the allowance to efficiently deliver the finalised scope of these schemes.

For the draft determination we assumed 6% development allowance for schemes in the large scheme gated process. We set out that each of the large schemes would make two formal gate submissions. The first submission would set out progress of scheme design and feasibility assessments. This would provide information like the requirements defined for gates 1&2 of the RAPID process. The second submission, broadly aligned with the requirements for RAPID gate 3, which will be the key decision point where the agreed scheme and cost will be approved for delivery. We expected the first large scheme gated submission on 3 November 2025 and the second large scheme gated submission on 4 May 2026. For the gate 3 submission we will assess company evidence to make draft decisions by late summer 2026, followed by a consultation and conclusion by December 2026.

At the second gate decision stage, allowance revenues would be logged-up based on differences between the revised view of efficient costs to deliver the scoped scheme and our original development allowances, for an adjustment to the RCV at the end of the period. Anything beyond this would be subject to normal cost sharing. We also said we would consider in period revenue changes in-period if companies can provide evidence that revenue is required for financeability, on a notional basis. We proposed to include financial incentives on the formal gate submissions to encourage timely, complete and good-quality evidence. Penalties will be applied at a rate of 2% (of the development allowance) per complete month that a submission is late or until a sufficient quality submission is received.

Stakeholders' representations

In their representations to the draft determinations, all companies that had schemes included were supportive of both approaches. Some companies²²⁴ reallocated schemes between the two approaches due to continued growing certainty of some schemes. Some companies²²⁵ also included additional schemes into the large schemes approaches. Southern

²²⁴ Southern Water and United Utilities moved six schemes to enhanced engagement from the gated approach

²²⁵ Northumbrian, Severn Trent, Southern, and United Utilities added seven schemes in total to the gated approach and Southern added two new schemes into enhanced engagement.

Water suggested that the development allowance of 6% should be increased and that timelines for gate submission should be more flexible to reflect schemes in different stages of development. Northumbrian water suggested that the submission timelines should align with WRMP requirements. Some companies also stated that Ofwat should consider in-period determinations or higher upfront allowance due to the uncertainty raising commercial and financeability concerns.

In its representation, the Environment Agency raised concerns that the gated process could delay statutory projects, potentially causing environmental damage and other knock-on effects. It also states that the risk increases if the company does not pass gate 3 until the end of 2027.

Our assessment and reasons

In relation to the concerns raised by the Environment Agency, the large schemes gated process was introduced at the draft determination due to concerns over the certainty of scope and costs for some large schemes. The gated process will provide greater certainty for scheme costs and scope and help to deliver solutions quicker than alternative funding approaches. The reduced number of gates (building on experience of RAPID) and their timing have been determined to assist delivery. For the final determination, we are also allowing companies more flexibility over the timing of submissions to reduce the risk of delaying meeting compliance requirements. We will work with the Environment Agency, DWI, and other parties as part of the large scheme gated process so that schemes can progress as quickly as possible.

Below we provide more detail on the company representations and our assessments for the final determination. This includes;

- new schemes proposed by the companies or included by us in either large schemes gated approach or enhanced engagement;
- schemes moved by companies from large schemes gated approach to enhanced engagement; and
- schemes removed or changed in either large scheme gated approach to enhanced engagement

If there is no change in the approach from the draft determination and the company in its representation agrees with the approach or does not comment, we do not specifically mention those schemes in this section. However, they are listed in the enhanced engagement or large schemes gated approach tables. Allowances may have changed for those schemes for the final determination to either align with company proposals or because of updated deep dives or outlier model outputs. See corresponding enhancement feeder models for more detail.

Northumbrian Water Howdon growth and WRMP

Northumbrian Water proposes two new schemes to be included in the large scheme gated approach, these are a growth scheme at Howdon STW and additional WRMP schemes.

For Howdon STW²²⁶ growth the company states it has deferred a significant proportion of expenditure into AMP8 and suggests that costs will increase to beyond those proposed at the 2019 price review because of changing environmental compliance guidance. Because of this it includes the scheme in the gated approach but includes no proposed investment. It states that there could be better developed scope and costs for the first gate submission in November 2025. The company has a significant allowance for growth at Howdon at the 2019 price review, which the company is yet to spend. Therefore, for the final determination we do not include the scheme the large schemes gated approach as it is not sufficiently developed.

For the additional WRMP schemes, the company states that these are additional schemes associated with Habitats regulations adaptive pathway and were identified after the business plan submission and the full costs are not yet established. Three schemes are identified but only development costs are proposed, which includes detailed investigation and design for three adaptive planning investments. We assess the proposed investment through the deep dive process and provide an adjusted allowance for the proposed investment. However, the schemes are not sufficiently developed to be included large schemes gated approach for the final determination. More detail is provided in the Water enhancement supply feeder model.

Northumbrian Water Bran Sands long sea outfall

Northumbrian Water proposes a new scheme at Bran Sands STW for the installation of a long sea outfall. This scheme was not included in the draft determination. Since draft determination, Defra has rejected the company's alternative proposals to meet the requirements introduced by the Levelling Up and Regeneration Act 2023 (LURA).

Northumbrian Water proposes the new scheme is included in enhanced engagement and cost sharing. We have concerns that the company's proposal is complex and novel which creates high levels of risk and uncertainty. There are benefits to be gained from further investigations which will reduce cost uncertainty and risk allocation. Therefore, for the final determination we include this scheme in the large scheme gated approach. See section 3.3.3 Nutrients – phosphorus and total nitrogen removal for more details.

²²⁶ Northumbrian Water received allowances at the 2019 Price Review for STW growth expenditure at Howdon. It also received enhancement allowance of £6 million for resilience improvements and the Competition Markets Authority (CMA) determination provided a further £6 million allowance to meet Industrial Emissions Directive (IED) requirements. A bespoke performance commitment was set at the 2019 Price Review to protect customers from under delivery, however the company is behind on delivery of its investment at Howdon. Consequently, for the final determination we apply a PCD for the delayed expenditure. See 'PR24 FD PD01 Outcome delivery incentives model 2024–25 – Northumbrian Water' for more details.

Severn Trent Water PFAS risk reduction and inland bathing waters

Severn Trent Water proposes two new schemes to be included in the large scheme gated approach. These are for meeting new compliance standards at inland bathing waters and for meeting new compliance standards at treatment works for PFAS risk reduction. The company provides indicative total cost for both in its representation but does not request the full funding amounts as scope for both schemes are highly uncertain. Instead, it requests development funding only for both. For the final determination, we allow the development funding in full for bathing waters and include it in the large schemes gated approach. This will provide the company with sufficient allowance to develop the right schemes to meet future compliance requirements. For the PFAS risk reduction programme, we allow the development funding in part but remove it from the large schemes gates approach. Instead, the scheme will form part of the PFAS uncertainty mechanism along with other DWI backed PFAS schemes. Please see the 'PR24 Final determinations: in-period adjustments appendix' for more information on in-period adjustments for PFAS schemes.

Severn Trent Water Wanlip Growth

Severn Trent Water proposes a scheme at Wanlip STW covering several interventions and drivers. The most significant costs are associated with growth at STW. Wanlip STW would have failed its dry weather flow (DWF) consent in 2023 if the Environment Agencies proposed '3 in 5' criteria was implemented. Severn Trent Water includes this scheme in its representations, despite being absent in its original business plan submission. The proposed intervention comprises a new activated sludge treatment stream and associated settlement, new inlet works, activated sludge plant improvements, liquor treatment, chemical dosing and tertiary solids removal, as well as other upgrades. We initially assessed the scheme as part of the scheme level modelling within the Growth at STW model. However, the scheme was deemed an inefficient outlier and removed from the model to be assessed as an outlier. In the final determination we include the scheme in the enhanced engagement approach because of the scale and uncertainty around scope and costs. The costs of meeting existing permits should be excluded from enhancement expenditure and covered as part of base expenditure. Details on the outlier assessment can be found in Growth at STW enhancement feeder model.

Southern Water network and information systems (NIS) and SEMD

Southern Water request that we allow the company to combine their Network and Information Systems (NIS) and SEMD proposals, and to use the Ofwat large scheme gated process with amendments to deliver the outcomes as the request is >£100m and has scope and cost uncertainties. We do not support combining these schemes or making amendments to our large scheme gated approach. We consider the security schemes are not of the same value, size and complexity as the Thames Water security proposals. While there are likely to be interlinkages and delivery considerations between some parts of the programmes of work, the requirements and DWI legal instruments are separate and independent for NIS and security. Therefore, we do not support the company's request for inclusion of these in the

large scheme gated approach. We assess the schemes through our deep dive approach, see the Cyber and SEMD enhancement feeder models for further details.

Southern Water Whitfield Growth

Southern Water proposes a growth scheme at its Whitfield STW to be included in the large schemes gated approach. For the final determination we include the Whitfield STW scheme in the gated approach, because this is an entirely new sewage treatment works (STW) to provide wastewater treatment for the Whitfield Urban Expansion development, with large levels of uncertainty around scope and integration with existing nearby STWs. We understand that another option (utilisation of Broomfield Bank) with a materially different scope is also being considered.

Southern Water Hastings and Isle of Sheppey network resilience

We propose to include Southern Water's proposed network resilience schemes at Hastings and the Isle of Sheppey in the large schemes gated approach. The value of the combined schemes is £50 million, which means are moving away from the standard approach to include schemes over £100 million in this approach. This is because we have scope and costs concerns for both elements of this scheme and they were also not submitted at draft determinations adding further to the uncertainty. In its representations, the company does not provide sufficient and convincing evidence to allow the costs in full, but we believe a need exists due to historical supply interruption issues in the Hastings and Isle of Sheppey zones. Therefore, we include this in the large schemes gated approach which provides a development allowance to conduct further investigations and firm up scheme scope and costs. See section 3.8 Resilience and security for further details.

Southern Water combined sewer overflow and Southampton link main

Southern Water also propose two additional schemes to be included in the enhanced engagement approach, these are a programme of combined sewer overflow (CSO) improvements and a link main in Southampton. The company does not provide sufficient and convincing evidence as to why the proposed CSO programme should be included in enhanced engagement or why they should be treated differently to other CSO schemes. Therefore, for the final determination we do not include the CSO programme in the enhanced engagement approach but assess alongside other CSO schemes and provide allowances through the standard cost modelling approach for these schemes. See the Storm overflow enhancement feeder model for more detail. For Southampton link main, the company includes this in enhanced engagement due to changes in scope and cost. We also have concerns around scheme cost, in particular costs in later stages of the project development. Therefore, for the final determination we include this scheme in the enhanced engagement approach. See the supply interconnectors enhancement feeder model for more detail.

Thames Water Beckton Sludge Powered Generator (SPG) replacement

Thames Water propose including a sludge treatment scheme at its Beckton sludge treatment centre in the large scheme gated approach. The scope of the scheme includes thermal hydrolysis (THP) processing to replace the existing sludge powered generator. The costs relating to the scheme are included in base expenditure given it is about the replacement of existing assets. This is unlike other schemes included in the large scheme gated process which are enhancement expenditure. The company estimates scheme will take five to six years to construct, with forecast scheme costs of £166.8 million during the 2025–30 period, and total project costs across 2025–35 of £277.0 million.²²⁷

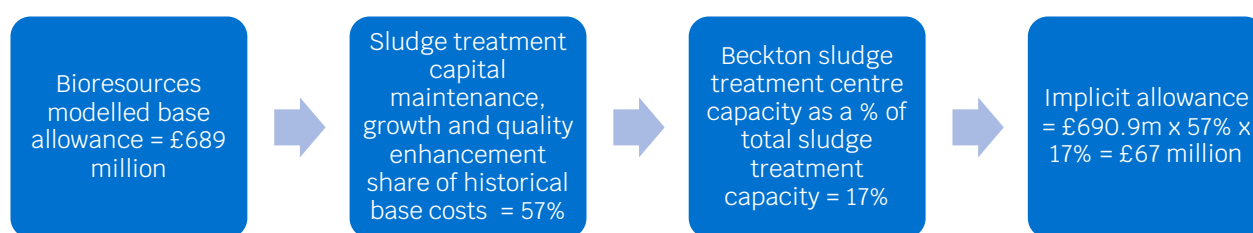
We accept the need for Thames Water to deliver this investment. It will mitigate risk to operational resilience and the sludge management chain for the site and surround areas that the site serves. The company has also selected the least regret option as the proposed technology can be adapted by using pelletizers (or equivalent drying options / type of advanced thermal conversion technology) to minimise operational risk.

We accept the company's proposal to include the Beckton SPG replacement scheme in the large gated scheme process. Our analysis indicates that Thames Water would be unable to deliver this investment through its bioresources base expenditure allowance and future operational and capital maintenance savings alone given the size of the scheme. But limited cost efficiency evidence has been provided, and the scheme has not been fully developed. So there is substantial scope and cost uncertainty.

We do not provide an additional development allowance for this scheme. Our analysis identifies an implicit allowance through the bioresources base cost models of £67 million (before frontier shift efficiency and real price effects), which is sufficient to allow the company to develop the scheme. This accounts for the implicit allowance for advanced anaerobic digestion upgrades and sludge treatment capital maintenance in the bioresources base expenditure allowance, as shown below:

²²⁷ Before frontier shift efficiency and real price effects.

Figure 19 : Beckton Sludge Powered Generator (SPG) replacement implicit allowance



We will review the need for additional allowances with the gate submissions. We will only consider providing additional allowances above the implicit allowance of £67 million to avoid customers paying twice, once through the bioresources base cost models and again through the large scheme gated process. We have included a conditional allowance of £99.8 million in the expenditure allowances summary tables (AMP8 request of £166.8 million minus implicit allowance of £67 million).

United Utilities Lake Windemere water quality

United Utilities propose to include a new scheme at Lake Windemere to address water quality issues in the large scheme gated approach. In its representation the company states that there is uncertainty due to late inclusion in the WINEP programme, and that options are not fully developed. We also have concerns over the level of development of scope and scheme costs. Therefore, for the final determination, we include this scheme in the large scheme gated approach. See section 3.3.3 Nutrients – phosphorus and total nitrogen removal for more details.

Southern Water treatment works resilience schemes

Southern Water increases the scope of and moves water treatment works resilience schemes from the large scheme gated approach to enhanced engagement. In its October 2023 business plan, it included a scheme to improve resilience four treatment works. In the draft determination we included two of these works (WTW1 and WTW2) in the large schemes gated approach. In its representation, the company proposes to include all five water treatment works resilience schemes in the enhanced engagement approach. This would increase the scope and cost significantly. The company states that these schemes are primarily due to be delivered in the 2025–30 period therefore should be included in the enhanced engagement approach. We still have concerns around the scope and proposed costs for original two works, but consider that scope and proposed costs of the additional three schemes are more certain. Therefore, for the final determination we include resilience and supply schemes at the original two works (WTW1 and WTW2) in the large scheme gated approach and assess and make allowances for the others through the deep dive process. Please see section 3.8 Resilience and security for further details.

United Utilities Davyhulme, Eccles and Wigan P removal and Sanitary determinants

United Utilities propose to move schemes associated with phosphorus removal and compliance with sanitary determinants at its Davyhulme, Eccles and Wigan STWs from the large scheme gated approach to enhanced engagement. In its representation, the company considers that the scope and costs are now more certain and that it has adaptive plans agreed with the Environment Agency. It also states that some contractual agreements for delivery are already in place therefore allowances are required upfront. The company provides sufficient and convincing evidence to demonstrate that the scope and costs are now more certain than in its October 2023 business plan. Therefore, for the final determination we include these schemes in the enhanced engagement approach. See the PR24 N and sanitary determinants enhancement feeder models for further details.

Anglian Water Colchester water recycling

Anglian Water removes its water recycling scheme at Colchester from the large scheme gated approach due to scheme rescoping and reduced cost. However, we still have concerns around the certainty of scope, because there are likely to be additional assessments of the environmental acceptability of the scheme by the Environment Agency. Therefore, for the final determination we retain the draft determination approach and retain the scheme in the large scheme gated approach.

Anglian Water Fenland to Norfolk Bradenham supply interconnector

Anglian Water, in its representation, includes the Fenland to Norfolk Bradenham potable transfer interconnector scheme (NBR6) as enhanced engagement. In the draft determination we combined this scheme with two others for the purposes of assessing the combined WAFU benefit and included in the enhanced engagement approach. The company states it has no issues with this approach, but considers that the capacity of the interconnectors, rather than the WAFU benefit would be more reflective of the actual cost drivers of the interconnector schemes. For the final determination we retain our draft determination approach and continue to assess the WAFU benefit of the combined interconnector schemes, not capacity benefit, and set allowances on this basis. Therefore, all three²²⁸ schemes are combined and included in the enhanced engagement approach. These three interconnector schemes together provide the 45ML/d WAFU gain to the company's supply demand balance. See the supply interconnectors enhancement feeder model for more detail.

²²⁸ The three schemes included in the enhanced engagement approach for the final determination are Fenland to Norfolk Bradenham potable transfer (NBR6), Norfolk Bradenham to Norwich and the Broads potable transfer (NTB10) and Norwich and the Broads to Aylsham potable transfer (NAY1).

Anglian Water Cambridge Water to Cambs and West Suffolk supply interconnector (also referred to as Grafham to Bury interconnector)

Anglian Water, in its representation, includes its Cambridge Water to Cambs and West Suffolk interconnector scheme (SWC8) as enhanced engagement. In the draft determination we combined this scheme with Ruthamford South to Cambridge Water potable transfer scheme (CAM4) for the purposes of assessing the combined WAFU benefit and included it in the enhanced engagement approach. The company states it has no issues with this approach, but considers that the capacity of the interconnectors, rather than the WAFU benefit would be more reflective of the actual cost drivers of the interconnector schemes. For the final determination we continue to assess the WAFU benefit of the interconnector schemes, not capacity benefit, and set allowances on this basis. Therefore, both schemes²²⁹ are combined and included in the enhanced engagement approach. Together the two interconnector schemes provide the 50MI/d WAFU gain to the company's supply demand balance. See the supply interconnectors enhancement feeder model for more detail.

Northumbrian Water combined sewer overflow (CSO) spill reductions

Northumbrian Water's combined sewer overflow (CSO) spill reduction schemes at Teeside Marske and Berwick on Tweed STW were included as enhanced engagement in the draft determination. In its response the company removes these schemes from the enhanced engagement list and provides no commentary. Therefore, given the scale of these schemes, for the final determination we retain our draft determination approach and retain these schemes in the enhanced engagement approach.

Northumbrian Water Lowestoft and North Suffolk water recycling

Northumbrian Water includes its Lowestoft recycling scheme and North Suffolk reservoir schemes together in the gated approach. However, we consider that the North Suffolk reservoir scheme is more closely linked to strategic resource option development and therefore include it in the RAPID gated approach. We retain Lowestoft recycling in the large scheme gated approach.

Wessex Water Poole STW Phosphorus removal

In the draft determination we assessed the phosphorus removal scheme at Poole as part of the outlier modelling approach and applied an adjustment. The phosphorus removal scheme for Poole was included in the enhanced engagement approach due to its scale and uncertainty around scope and costs. We assessed the nitrogen removal scheme at Poole in the deep dive approach and applied an adjustment. In its representation the company requested that we consider the costs for phosphorus removal and nitrogen removal at Poole

²²⁹ The two schemes included in the enhancement engagement approach for the final determination are Ruthamford South to Cambridge Water potable transfer scheme (CAM4) and Cambridge Water to Cambs and West Suffolk interconnector scheme (SWC8).

STW as one scheme, providing additional evidence on the complexity of the scheme, stating that the scale of permit tightening across multiple measures means that the models do not adequately reflect the required investment. For the final determination, we acknowledge that there is a risk that the models do not adequately account for the scale and complexity of the scheme, particularly given the multiple drivers, and accept the company proposal to consider both phosphorous and nitrogen elements as one scheme in the enhanced engagement approach. The company provides additional evidence of cost efficiency. However, we still have concerns whether that the investment is efficient. We recognise that this is a large and complex scheme and reduce the draft determination adjustment for the final determination and it will be subject to enhanced engagement and cost sharing rates.

Our final determination

For the final determination we largely retain the approach from the draft determination, as this was generally welcomed by companies. In response to the company representations, we make the following changes:

- **Development allowance:** For the final determination we retain 6% development allowance as the minimum allowance for most schemes in the large scheme gated process. This is consistent with the development cost proposals for most schemes included by companies and aligns with the approach for strategic resource options (SRO) applied at the 2019 price review and for the final determination. We also increase the development allowance to 12% for water recycling schemes. This aligns with allowances provided for water recycling SRO schemes for the final determination. There are four recycling schemes where we provide 12% development allowance²³⁰. Additionally, we allow 12% development allowance for the Southern Water resilience schemes and Northumbrian Water Bran Sands scheme.
- **Timing of submissions:** For the large schemes gated process we will consider scheme specific factors and be flexible on submission dates. Companies will be able to provide submissions earlier than the required submission dates (see below), as long as sufficient notice is provided. We will require at least 2 months notice to assess early submissions. We will also consider requests to delay second submissions by one year, any such request should be provided with the first submission and be agreed with other relevant regulators.
- **Cost sharing:** For the large scheme gated process, in the draft determination we said any costs incurred beyond the allowed revenue (decided at the gate 3 submission) would be subject to normal cost sharing. For the final determination we confirm that cost sharing rates will be set at 25:25 for these schemes. This means that companies will bear 25% of the cost of any overspend and retain 25% of the benefit from any underspend. Additionally, cost sharing rates will also apply to development allowances set for these

²³⁰ Anglian Water recycling scheme at Colchester and Northumbrian Water recycling scheme at Lowestoft. Southern Water recycling schemes at Sittingbourne and Sandown.

schemes. This should retain incentives for companies to be efficient for both the scheme development and delivery stages

- **Revenue adjustments:** For the large schemes gated process, in the draft determination we said that at the second submission decision stage, allowance revenues would be logged-up based on differences between our view of efficient costs to deliver the scoped scheme and our original development allowances. This would be done through an adjustment to the RCV at the end of the period unless in period revenues were required for financeability reasons. For the final determination, we retain the approach to adjust allowances at the end of the period but we will also allow in-period revenue adjustments based on the in-period adjustment mechanism set out in the separate appendix. Please see the 'PR24 Final determinations: In-period adjustments appendix' for more information on in-period adjustments.

Our final allowances for large schemes are set out in the following tables. We consider a total of 28 schemes (21 in the draft determination) with a total delivery cost of £5.5 billion (£4.5 billion in the draft determination) are suitable for these processes by meeting one or more of the criteria described above. Of these, 15 schemes with a total delivery cost of £3.2 billion are suitable for enhanced engagement and cost sharing (£1.8 billion in the draft determination). A further 13 schemes, with a total delivery cost of £2.3 billion (£2.8 billion in the draft determination), are appropriate for the more structured large scheme gated process.

Enhanced engagement and cost sharing requirements

For enhanced engagement schemes we assess the schemes through the benchmarking modelling approach or deep dives. As a result, we remove £293.5 million of costs in AMP8, resulting in a £2.7 billion allowance in the final determination (from a total AMP8 request of £3 billion). Further detail of the assessments for each scheme and the level of challenge applied can be found in the corresponding enhancement models.

Enhanced engagement and cost sharing should incentivise companies to deliver the proposed schemes and outcomes at an efficient cost but protect customers and companies if the costs are significantly different to forecast. We apply 25:25 cost sharing rates for these schemes. This means that companies will bear 25% of the cost of any overspend and retain 25% of the benefit from any underspend. This should retain incentives for companies to be efficient.

Although these are high value schemes with uncertainty around the efficient delivery costs, it is a light touch process without formal submission gates. We expect regular engagement with Ofwat (initially quarterly) with formal submission dates of scheme development and progress in September/October 2025 and March 2026 (dates to be confirmed). These submissions should include evidence of the activities (such as feasibility, scoping, and design changes that underpin changes to scope and cost) as expected for the large schemes gated process as set out in the table below. The submissions will allow us to better

understand progress and the emerging scope and costs of schemes. The company will be expected to engage with other regulators (eg Drinking Water Inspectorate and Environment Agency) as necessary through the development and delivery of these schemes. The submissions will not be formal decision points with the company responsible for the scoping, design and delivery of the scheme based on the efficient allowances determined at the price review. We expect the two formal submissions to be assured by third-party assurers and changes to scheme scope and costs to be included in the provided change log. Tracking of changes to the scheme and robust assurance will provide greater confidence that the final scheme scope and costs provided in the second submission are as accurate as possible to ensure effective application of the cost sharing mechanism (if it is needed). Further detail on the assurance requirements are provided in the document 'PR24 final determinations: Expenditure allowances – assurance requirements for delivery of enhancement schemes appendix'.

Table 40: Enhanced engagement and cost sharing allowances

Company	Area	Category	Name of scheme	Total AMP8 allowance £m	Total AMP8 request £m	Level of challenge in AMP8 £m
Anglian	Water	Supply interconnector	Fenland to Norfolk Bradenham transfer (NBR6), Norfolk Bradenham to Norwich and the Broads transfer (NTB10) and Norwich and the Broads to Aylsham transfer (NAY1).	191.82	200.25	8.43
Anglian	Water	Supply interconnector	Ruthamford South to Cambridge Water transfer (CAM4) and Cambridge Water to Cambs and West Suffolk (SWC8) interconnectors	265.96	266.12	0.16
Northumbrian	Waste	CSO spill reduction	Teesside Marske and Berwick on Tweed	504.65	504.26	-0.39
Southern	Water	Supply interconnector	Southampton link main	125.43	117.77	-7.66
Seven Trent	Water	Resilience interconnector	Interconnectors	131.46	131.46	0.00
Seven Trent	Waste	Growth at STW	Wanlip	95.39	232.70	137.31
Thames	Waste	P removal	Rye Meads STW	112.09	124.57	12.48

Thames	Waste	Growth at STW	Didcot STW	88.35	105.28	16.93
United Utilities	Water	Water quality	Vyrnwy aqueduct relining	138.64	154.04	15.40
United Utilities	Waste	Sanitary parameters & P removal	Davyhulme STW	291.79	291.79	0.00
United Utilities	Waste	Sanitary parameters & P removal	Eccles STW	159.82	177.58	17.76
United Utilities	Waste	Sanitary parameters & P removal	Wigan STW	92.28	102.56	10.28
United Utilities	Waste	Sanitary parameters	Salford STW	234.59	260.65	26.07
United Utilities	Waste	CSO spill reduction	Pennington flash	74.16	111.84	37.68
Wessex Water	Waste	P&N removal	Poole STW	171.30	190.34	19.04
Total				2677.72	2971.20	3200.17

Large scheme gated process requirements

For schemes that proceed through the large scheme gated process, we have allowed £260.5 million for development funding for thirteen schemes. This leaves a 2025–30 contingent allowance of £1.8 billion available under the large scheme gates process, subject to further scheme development, cost efficiency assessment and approval.

For large schemes with high levels of optioneering, scope and cost uncertainty, or novel technologies we apply a large scheme gated process. Companies are provided with 6% of total scheme cost as development allowance for six schemes, a further six schemes are provided with up to 12% development allowance of total scheme cost (as set out in the table below).

We expect two formal submissions for the large schemes gated process. The requirements for these submissions are set out in the table below. The first submission is required to provide updates on progress of scheme development. This is not a formal decision-making gate but we may provide feedback to the company if we consider it is required. The second submission will be the key decision point where the agreed scheme and cost will be approved for delivery. Our current indicative timeline is first submissions to be provided in September/October 2025 and the second submission in March 2026. For the second submission we will assess company evidence to make draft decisions by early summer 2026,

followed by a consultation and conclusion by December 2026²³¹. Companies will be able to provide submissions earlier than the required submission dates, as long as sufficient notice is provided. We will require at least 2 months notice to assess early submissions. We will also consider requests to delay the second submissions by one year, any such request should be provided with the gate first submission and agreed with other regulators. The assessment of scheme costs will be based on PR24 benchmarks and or engineering reviews (consulting with other regulators as necessary). We expect to see continued improvement in certainty of scope and costs with each submission.

The indicative requirements for each submission are set out below. We do not intend to publish detailed guidance on the requirements for each submission. This is because a range of different schemes are included in the large schemes gated process and setting out detailed guidance for each would not be practical. The submissions should contain evidence demonstrating the activities that have taken place and the impact of those activities on changes to scheme scope, cost and outcome. All material changes must be documented in the change log²³², which is provided with the final determination documentation. The assessment of scheme costs will be based on PR24 benchmarks and or engineering reviews (consulting with other regulators as necessary). We expect to see continued improvement in certainty of scope and costs with each submission. The purpose of each submission is to provide Ofwat with greater certainty on scope, cost and scheme outcome to enable the final solution to be approved for delivery and appropriately funded.

Key reporting tools for the submissions include: the change log; risk register; scheme level delivery plan; and costing methodology. These key documents will be utilised throughout the process, therefore we will engage further with companies to ensure the design and purpose is clear up front.

Each submission must be accompanied by a report from the company's third-party assurance provider, further detail on the assurance requirements are provided in the document 'PR24 final determinations: Expenditure allowances – assurance requirements for delivery of enhancement schemes appendix'.

The four supply water recycling schemes will also be subject to a level of RAPID oversight and should therefore follow the requirements of the RAPID light touch process in parallel (see 'PR24 final determinations: Major projects and delivery appendix'). In parallel to the large scheme gated requirements, this will include regular engagement meetings with RAPID, similar to checkpoint meetings, to monitor the progress of projects to ensure risks and issues are being identified and solution owners are taking proactive steps to shape the thinking on these issues. These solutions will not be subjected to any formal gated submissions as part of

²³¹ We intend to review the submission dates to ensure they align with the bespoke interim determination process, this will be done after a consultation on the bespoke IDOK process in early 2025.

²³² The requirements for the change log are set out in the document: PR24 final determinations: Expenditure allowances – Assurance requirements for delivery of enhancement schemes appendix

the RAPID gated process. We also expect each submission to contain relevant approvals and views from (where required) from other stakeholders such the Environment Agency and DWI.

Table 41: Large scheme gate submission requirements

Gate	Large schemes gate requirements ²³³	Large schemes submission details
1&2	Optioneering and multi-solution decision making²³⁴ • Evidence of an unconstrained set of potential options over a range of intervention types to meet the identified need. • Demonstration of engagement with stakeholders, where appropriate (eg. Environment Agency, DWI and local authorities) • Demonstrate robust decision making and robust cost-benefit appraisal that clearly shows best value for customers and the environment to inform the selection of the proposed solution • Evidence of costing methodology and approach, including benchmarking, been applied to derive the cost of options Design confirmation • Evidence of appropriate outline design to enable engagement with the supply chain • Evidence of Initial feasibility studies • Evidence of ongoing demonstration of engagement with relevant stakeholders (inc customers) where appropriate • Supported with detailed economic and engineering rationale and evidence where necessary • Set out proposed price control deliverables (PCD) • Set out the draft delivery plan and programme for the plan of interventions (including a programme for third party approvals and consents) • Provide a risk register indicating risks to scope, programme and costs and the scale of the impact and proposed mitigations	Submission 1 – September/October 2025 • One submission representing evidence gathered during gate 1&2 requirements set out • Progression and quality check. Not a decision making gate for cost allowances or continuation of scheme. • Must include evidence of support for the proposed solution from Environment Agency or DWI. • Must be accompanied by a third-party assurance report • A completed changed log must also be provided setting out any material changes to scope, programme and cost, the scale of the change, the cause of the change and the impact for customers and the environment. • A risk register indicating risks to scope, programme and costs and the scale of the impact and proposed mitigations. • A draft delivery plan and programme (including a programme for third party approvals and consents) • Penalties will apply for late and/or poor quality of submission based on 2% of development funding per month until acceptable quality submission is received.
3	Solution Delivery Plan • Evidence of developed final designs, finalised feasibility, pre-planning investigations and procurement strategy • Evidence of completion of pre-planning investigations and planning application, where appropriate	Submission 2 – March 2026 • Submission representing evidence gathered during gate 3 activities. • A decision-making gate for cost allowances and definition of scheme and PCD. • Main submission to Ofwat for both enhanced engagement and large scheme gated approaches. For

²³³ These are indicative requirements and may differ from scheme to scheme, but is intended to set out the level of evidence expected to underpin scheme development

²³⁴ These activities are likely to be incorporated to existing strategic planning approaches such as WRMP, WINEP and DWMPs, therefore will be largely complete for some schemes well before submission date.

Gate	Large schemes gate requirements ²³³	Large schemes submission details
	• Evidence of ongoing demonstration of engagement with relevant stakeholders (inc customers) where appropriate • Evidence of agreement of plans with stakeholders were required (Environment Agency and DWI) • Identification of appropriate supply chain partner (if applicable) • Confirm price control deliverables (PCD) for the delivery phase. • Finalised detailed costs set out with benchmarking to ensure efficiency. • Finalised strategy and delivery plan for the plan of interventions to be set out. Where multiple schemes across multiple sites are proposed, a prioritised list of reserve schemes should be provided, if a scheme is not taken forward. • Updated risk register setting out risks to scope, programme and costs. Where appropriate, risks should be costed at this stage.	large gated schemes, these cannot move into delivery until approval is granted at this gate. • Must include evidence of support for the proposed solution from Environment Agency or DWI if required • Must be accompanied by a third-party assurance report • A completed change log must also be provided • Updated risk register setting out risks to scope, programme and costs. Where appropriate, risks should be costed at this stage. • A final delivery plan and programme (including a programme for third party approvals and consents) • Penalties will apply for late and/or poor quality of submission based on 2% of development funding per month until acceptable quality submission is received.
4	Delivery • No submission required.	N/A

At the second submission decision stage, allowance revenues would be logged-up based any differences to the revised agreed view of efficient costs to deliver the scoped scheme to our original development allowances for an adjustment to the RCV at the end of the period as default. Anything beyond this would be subject to 25:25 cost sharing. The development allowances provided will also be subject to 25:25 cost sharing. This means that companies will bear 25% of the cost of any overspend and retain 25% of the benefit from any underspend in both the development allowance and final scheme costs. This should retain incentives for companies to be efficient. We do not apply a time value for money adjustment for logging up to encourage efficiency and value engineering in option development. We will allow revenue changes in-period, the criteria and process for this are set out in the 'PR24 Final determinations in-period adjustments appendix'.

We continue to include financial incentives on the formal gate submissions to encourage timely, complete and good-quality evidence. Penalties will be applied at a rate of 2% (of the development allowance) per complete month that a submission is late or until a sufficient quality submission is received. For example, if a poor-quality submission is received on time, we will review and feedback to the company for it to address quality issues. The penalty will apply until a submission is returned meeting the expectations.

Table 42: Large schemes gated approach allowances

Company	Area	Category	Name of scheme	Development funding allowance (AMP8) £m ²³⁵	Contingent allowance (AMP8) £m	Total scheme cost £m
Anglian	Water	Water recycling	Colchester ²³⁶	14.62 (12%)	52.18	121.83
Northumbrian ²³⁷	Water	Water recycling	Lowestoft ²³⁸	8.67 (10.88% ²³⁹)	67.76	79.70
Northumbrian	Waste	Nitrogen removal	Bran Sands long sea outfall ²⁴⁰	29.63 (12%)	217.28	246.91
Southern	Water	Resilience at WTW	WTW 1 & 2 ²⁴¹	34.37 (12%)	252.01	286.38
Southern ²⁴²	Water	Network resilience	Hastings Isle of Sheppey ²⁴³	3.00 (6%)	47.00	50.00
Southern	Water	Water recycling	Sandown ²⁴⁴	23.26 (12%)	170.58	193.84
Southern	Water	Water recycling	Sittingbourne ²⁴⁵	14.60 (12%)	106.76	121.32
Southern	Waste	Growth at STW	Whitfield ²⁴⁶	6.22 (6%)	77.58	103.74
Seven Trent ²⁴⁷	Waste	Bathing waters	Inland Bathing Waters ²⁴⁸	75.93 (6%)	0.00	Unknown
Thames	Water	SEMD	Security ²⁴⁹	28.29 (6%)	443.18	471.46
Thames	Water	Raw water deterioration	UV programme ²⁵⁰	10.75 (6%)	168.37	179.12

²³⁵ Development allowance percentage is shown in brackets

²³⁶ Scheme scope provided in ANH_DD_018-Resilient-to-flood-enhancement strategy.pdf

²³⁷ Less than £100m threshold but included due to significant uncertainty of scope and cost

²³⁸ Scheme scope in NES14 – A3-01 Enhancement Case WR – Water Supplies.pdf

²³⁹ 10.88% development allowance is in line with development proportion decision set in October 2022 in the Accelerated Infrastructure Delivery Project

²⁴⁰ Scheme scope in NES28 – A3-14 Enhancement case WWN – WINEP Protected Areas and Bathing Waters.pdf and NES28A – Protected areas – supplementary business case for long sea outfall.pdf

²⁴¹ Scheme scope in SRN25 Supply Resilience Enhancement Programme.pdf

²⁴² Less than £100m threshold but included due to significant uncertainty of scope and cost

²⁴³ Scheme scope in SRN-DDR-037-Water Network Resilience and Disinfection Enhancement Cost Evidence Case.pdf

²⁴⁴ Scheme scope in SRN26 Water Resources – Supply.pdf and SRN-DDR-028 – Water Resources – Supply Enhancement Cost Evidence Case.pdf

²⁴⁵ Scheme scope in SRN26 Water Resources – Supply.pdf

²⁴⁶ Scheme scope in SRN-DDR-048 – Wastewater Treatment Growth Enhancement Cost Evidence Case.pdf

²⁴⁷ Highly uncertain inland bathing waters scheme, for which the company does not know the full requirement from the DWI. We include it in the large schemes approach as a mechanism to allow additional funding if required. We would only expect this to cover incremental costs over and above the scope allowed for inland bathing waters in the [green recovery process](#).

²⁴⁸ Scheme scope in SVE4.29 Waste WINEP Inland Bathing Waters.pdf

²⁴⁹ Scheme scope in TMS-2024-00008v2 for physical security.pdf

²⁵⁰ Scheme scope in TMS23 Enhancement case Long-term water quality strategy Cryptosporidium.pdf

Thames ²⁵¹	Waste	Sludge	Beckton Sludge ²⁵²	0.00	0.00	277.0
United Utilities	Waste	WINEP	Windermere ²⁵³	11.18 (6%)	175.21	186.39
Total				260.48	1777.90	2317.69

4.7.4 Delivery mechanism

What we said in our draft determinations

At draft determinations we proposed to include expenditure in a delivery mechanism for Thames Water and Southern Water as they were unable to provide assurance that they can deliver their full business plan. To address these delivery concerns, we included £944 million of expenditure for Thames Water and £465 million of expenditure for Southern Water in a delivery mechanism. This would allow them to claim additional expenditure allowances in 2025-30 when they are able to deliver the schemes.

We also proposed increased oversight for Southern Water and Thames Water. We proposed to require both companies to submit a delivery plan and delivery action plan detailing how they will deliver the schemes to access the additional funding throughout the 2025-30 period. We also proposed to require these companies to regularly report on their progress against these plans.

Stakeholders' representations

In response to our draft determinations, both companies were broadly supportive of the delivery mechanism. Thames Water recognised that the delivery mechanism provides a balance of oversight and allows the company to receive the funding required to deliver for customers and the environment. While Southern Water supports a delivery mechanism it wants a flexible approach to funding for schemes included in the mechanism.

Both companies requested confirmation that they would not be subject to late delivery penalties from price control deliverables (PCD) for schemes included in the delivery mechanism where we expect delayed delivery.

Southern Water also sought clarity on the operation of the delivery mechanism. Southern Water wanted the delivery mechanism to release funding incrementally on an annual basis or at 'gates'. It requested we provide partial funding (23%)²⁵⁴ upfront and with the remaining

²⁵¹ Scheme at Beckton sludge treatment works, development and contingent funding is provided through base allowances but company will be required to provide gate submissions.

²⁵² Scheme scope in TMS-DD-038 Thames Water PR24 DD Response – Enhancement Cases – unredacted.pdf

²⁵³ Scheme scope in UUWR_78_Windermere – Enhancement case.pdf

²⁵⁴ This is the percentage of total costs of delivering the schemes included in the mechanism for which the company is requesting funding as part of their core plan.

funding released at checkpoints for schemes set out in the delivery mechanism. It requested further detail on whether we would reassess the allocated funding at every gate. Southern Water also asked how we will decide to trigger the funding held in the delivery mechanism and how the company could appeal our in-period decisions.

Both companies submitted additional schemes for consideration. Thames Water proposed to include £1,759 million of expenditure in the delivery mechanism. It asked to add Industrial Emissions Directive (IED) schemes worth £334 million as part of the delivery mechanism. Southern Water proposed to include a total of £1,069 million of expenditure. The company asked to add new schemes to the delivery mechanism including £125 million for Water Resource Management Plan (WRMP) mains renewals, £72 million for water resilience, £30 million for chemical removal, £26 million for the tightening of sanitary parameters and £232 million for WRMP water supply schemes.

Our assessment and reasons

General approach

The delivery mechanism protects customers from paying upfront for benefits that companies may not be able to deliver to schedule. Once the company shows that it can deliver a scheme, the mechanism will release the pre-agreed scheme funding. This is the point at which scheme costs could be reflected in customer bills. By contrast, the large schemes gated process seeks to deal with uncertainty around the scope and/or costs of a scheme. Cost requirements are assessed through 'gates' and allowances are set once there is more certainty around the scope and costs of the scheme (see section 4.7.3 for more detail). Given the additional administrative burden that a gated process brings we apply this to schemes worth £100 million or more.

The schemes included in the delivery mechanism are relatively small (typically less than £10 million). It would be disproportionate to apply a gated process to schemes of this size. Therefore, we do not agree with Southern Water's request to apply a gated process to schemes included in the delivery mechanism.

We also do not consider that the introduction of a specific appeal mechanism for in-period determinations (which would require a licence modification) is necessary or proportionate because of the relative small size of the schemes and the focus on delivery. Southern Water will have the same opportunity as other companies to ask for a redetermination by the CMA if it disagrees with the expenditure allowances we have set as part of our final determinations.

The following key components will support the delivery mechanism:

- **Delivery action plan**, setting out the actions the company proposes to take to expand its delivery capacity.

- **Delivery plan** that has additional reporting requirements (see section 4.8.1 for further detail on delivery plan). Additional requirements include setting out milestones (on a detailed site-by-site basis and including intermediate milestones consistent with our staged gating process) for the completion of capital delivery programmes in both its 'core' plan and the 'extended' plan including schemes in the delivery mechanism.
- **Delivery progress report** to allow early sight of issues, each company would prepare a version at least every six months and up to every three months. In this delivery progress report, the company sets out progress against its delivery plan and delivery action plan. This report would be reviewed and commented on by a proposed monitoring third-party.

This additional oversight and monitoring regime provides the best opportunity of delivering all the schemes included in both the core and the delivery mechanism. It will also provide us with early sight of when either company may have potential issues.

Process for assessing requests under the delivery mechanism

In each of years two, three and four of the 2025–26 to 2029–30 period, each company will set out annually in advance (as part of the delivery plan progress report) the individual schemes in the delivery mechanism it considers it could deliver in the 2025–26 to 2029–30 period and would request the release of funding for those schemes ("the Funding Request"). We expect funding requests to be submitted in May of 2026, 2027 and 2028.

If we have confidence that the company can deliver those schemes, its price controls for one or more subsequent years would be adjusted to include the RCV run-off and allowed return arising from those schemes (together with confirmation of the regulatory financing arrangements).

We intend to set out our draft decisions in respect of the Funding Request in the summer following the request. We will use the in-period determination process for performance commitments to make changes to price controls (for which final determinations will be published by 15 December each year²⁵⁵). We have notified appropriate performance commitments to Thames Water and Southern Water for this purpose in the notifications of the PR24 final determination of price controls for those companies.

Evidence required for the assessment of the Funding Request

For the company to show it can deliver a scheme and get the additional funding to deliver the scheme, it should provide confirmation from the independent third-party assurer that:

²⁵⁵ This will require a licence modification to amend Part 3A of Condition B to extend the current deadline (no later than 15 November) for Ofwat to make in-period determinations each year.

- the start date and target completion date of the scheme included in the delivery progress report are correct;
- the company has a plan in place to deliver the scheme;
- the company has appropriately identified all the delivery risks for the scheme and has put in place actions to mitigate these risks; and
- the target completion date of the scheme is deliverable by the end of the 2025–30 period or no more than 3 months after the end of this period.

We do not expect the company to have detailed design work completed for the relevant scheme to demonstrate the ability to deliver.

Schemes included in the delivery mechanism

We have considered the scope of schemes within the delivery mechanism. We retain our approach in draft determination to remove schemes where we include them in the large schemes gated process.

We have assessed the companies' request to include additional schemes in the delivery mechanism. We do not agree to include additional schemes as further explained below. We provide the list of schemes that, subject to the change process explained below, are included in the delivery mechanism in the Delivery mechanism model.

The companies have until 31 July 2025 to confirm the final list of WINEP schemes to be included in the delivery mechanism. This is because we accept that there is still uncertainty around the schemes to be included in the mechanism given that the final WINEP is yet to be confirmed. Companies should confirm this list in their Delivery Plan submission in July 2025.

Companies can only make changes to the list of schemes within the expenditure areas covered by the delivery mechanism for each company (see table below). We are also capping the maximum overall allowances for schemes in the delivery mechanism to at the amounts set out in the table below.

We will adjust allowed revenue to reflect any changes in the list of schemes. We will do this through the Revenue Forecasting Incentive (RFI) formula in parallel with our blind year reconciliation which is due to be done by Autumn 2025.

Additional schemes proposed by Thames Water

Thames Water proposed to include Industrial Emissions Directive (IED) schemes totalling £334 million as part of the delivery mechanism. The company explained this is because of the operational challenges it faces in implementing the IED programme.

We do not consider it appropriate to include the IED schemes in the delivery mechanism because we expect the company to meet its legal obligations and Thames Water is already late in the delivery of IED schemes. The Environment Agency has set the delivery deadline for March 2025 for these schemes.

Additional schemes proposed by Southern Water

Southern Water proposed to include water resilience enhancement, water supply improvements and Water Resource Management Plan (WRMP) mains replacements totalling £428 million in the delivery mechanism.

Mains replacements are a routine activity that water companies carry out in every price control period. We expect Southern Water to have the experience and resources to continue carrying out this activity in the 2025–30 period. We therefore do not consider appropriate to include this activity in the delivery mechanism.

We have concerns regarding the inclusion of water supply and water resilience schemes in the delivery mechanism. Southern Water is behind in the delivery of its WRMP programme. The company should be making rapid progress on the delivery of water supply and resilience schemes. Delivering these schemes is a high priority for Southern Water as non-delivery could have a significant negative impact on the supply demand balance in the region, risking water supply shortages for customers. We therefore do not include these schemes in the delivery mechanism as it could introduce further delays in the delivery of these schemes.

Southern Water also proposed to include treatment for tightening sanitary parameters and chemical removal in the delivery mechanism (worth £56 million overall). These programmes are small and are not complex compared to schemes being delivered by other companies in this same area of expenditure. We do not therefore consider that we need to include these schemes in the delivery mechanism to protect customers or provide additional oversight and monitoring.

Allowances included in the delivery mechanism

The allowances in the delivery mechanism will cover the efficient costs of delivering the schemes included in the delivery mechanism. We are setting these allowances in this final determination and do not expect to reopen them as part of the delivery mechanism in period assessment.

Southern Water and Thames Water requested to receive part of the total allowances of schemes included in the delivery mechanism as part of their 'core plan' funding. They argued that this is to fund the activities required prior to requesting the release of funding through the mechanism. Prior to submitting the Funding Request we would only expect companies to require carry out activities akin to gates one and two for the strategic resource schemes.²⁵⁶ For PR24, we expect expenditure to deliver gate one and two activities to be covered by base expenditure allowances. Therefore, for final determination, we are not providing part of the allowance for the delivery of schemes included in the delivery mechanism as part of the core plan.

Customer protection

We want customers to be protected from non-delivery or under-delivery of improvements funded through the delivery mechanism. Therefore, in the areas where we deem the application of a PCD to be appropriate we extend the coverage of the PCD to the schemes included in the delivery mechanism. At draft determinations we proposed to waive the application of the PCD claw-back (non-delivery PCD payment) for schemes where funding is not triggered through the delivery mechanism. Given that customers are not paying for the improvement in this scenario there is no need for the funding to be clawed back. We retain this proposal for final determination.

Thames Water and Southern Water asked for confirmation that they would not be subject to late delivery penalties from PCDs for schemes included in the delivery mechanism. Although we are including schemes in the delivery mechanism, we still expect both companies to deliver these schemes in line with legal deadlines. We want to encourage these companies to deliver improvements on a timely manner, even if the schemes are included in the delivery mechanism. Therefore, we include the application of time incentive PCDs to schemes included in the delivery mechanism. There is sufficient flexibility in the programmes of work subject to time incentives to allow companies to trigger schemes in the delivery mechanism and not be subject to time incentives.

Dealing with uncertainty

Where there are schemes in the core plan that are no longer needed, companies can use the available allowances in their core plan to deliver schemes in the delivery mechanism. Where this happens, companies should still include these schemes in their Funding Request so that PCDs can be reconciled at the end of the control period.

Our final determination

We retain the application of the delivery mechanism for Thames Water and Southern Water. This mechanism will release funding once the companies are in a position to deliver the

²⁵⁶ See [PR19 final determinations: Strategic regional water resource solutions](#), pp.14-15.

additional schemes. We consider that the additional oversight and monitoring regime provides the best opportunity of delivering all the relevant schemes. It will also provide us with early sight of when both companies may have potential issues.

We have updated the allowances included in the delivery mechanism to reflect the latest information provided by companies (see table below).

Companies are responsible for ensuring compliance with all legal obligations. The delivery mechanism does not alter this responsibility, nor does it impact our ability (or that of other regulators) to take enforcement action where necessary. The delivery mechanism does not protect companies from the consequences of non-delivery.

Table 43: PR24 delivery mechanism allowances (£m)

Enhancement area	Thames Water	Southern Water
Continuous water quality monitoring		40.37
Storm overflows	466.92	264.22
Chemical removal	187.09	
Phosphorus removal	568.14	170.59
Nitrogen removal		77.69
Total	1222.15	552.87

4.7.5 Storm overflows uncertainty mechanism

What we said in our draft determinations

At draft determination we set out that despite proposing funding for 2,533 storm overflow schemes, there is uncertainty over the number of storm overflow schemes that may be required in the 2025–30 period.

This is due to:

- Improvements required to meet Urban Waste Water Treatment (England and Wales) Regulations 1994 (UWWTR):** While some proposed storm overflow schemes are the result of investigations in the 2025–30 period, some are dependent on the outcome of investigations in the 2025–27 period. Some of these investigations may lead to some storm overflow schemes no longer being required and some may lead to new storm overflow schemes being required. If investigations lead to storm overflow scheme requirements related to the UWWTR then the Environment Agency expects these to be completed as soon as possible, and no later than three years after the completion of the investigation.

- **Future designation of Bathing Waters:** Bathing Waters are designated in May each year by Defra, with the first year's classification results published in November each year. Companies should now be aware of this year's designations, and we expected new/revised WINEP/NEP schemes required as a result to be included in responses to the draft determination. Bathing Waters in Wales are designated by Welsh Government. However, we recognised that there may be a need for new storm overflow schemes in the 2025–2030 due to future designations.
- **Defra's review in 2027 of the Storm Overflows Discharge Reduction Plan:** In the Storm Overflows Discharge Reduction Plan (SODPR), the Secretary of State set out that there was a need to be careful of the impact of storm overflow investment on water bills, and if we can go faster, we will, with a mandatory review in 2027 to see if we can go further.²⁵⁷ There is uncertainty around the impact of this review and whether it could lead to a requirement for further investment on Storm Overflows in the 2025–2030 period.

Our approach to setting price control deliverables provides companies with flexibility to switch the location of schemes, by holding companies to account for the number of schemes and total volume of equivalent storage delivered. This will allow companies to swap in and out schemes if required during the price control period. We expect all companies to maximise the delivery of storm overflow schemes within the period. Where companies identify additional schemes required under UWWTR requirements, to meet newly designated bathing waters, or due to revision of the SODPR, and it is not possible to swap out existing schemes, we propose to include an uncertainty mechanism. This will provide additional funding for companies through the PR24 reconciliation at PR29, if companies have delivered additional storm overflow schemes and storage in the 2025–30 period and have overspent storm overflow storage scheme allowances. This will apply solely to grey/hybrid scheme allowances, giving companies the flexibility to choose nature-based solutions.

Stakeholders' representations

Companies were broadly supportive of the uncertainty mechanism, although some requested that it go further:

New standards – Northumbrian water request expansion to include any new standards emerging from Ofwat's ongoing wastewater enforcement activities, stating that it does not recognise several of the standards that Ofwat is promoting in its enforcement notice.

Post AMP8 adjustment mechanism – South West Water agree with the principle of the storm overflow uncertainty mechanism, but suggest an uncertainty mechanism that is based on re-assessing delivery efficiency at the end of AMP8, using the same models as Ofwat develop for PR24. This could replace the complexity that PCDs will add to PR24.

²⁵⁷ [Storm Overflows Discharge Reduction Plan \(publishing.service.gov.uk\)](https://publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/125444/storm-overflow-discharge-reduction-plan.pdf), September 2023, p7.

Bathing Waters – Northumbrian Water request that it be extended to include improvements for new bathing waters, both for storm overflows and other unspecified interventions. United Utilities requests that it is expanded to include disinfection of final effluents.

Emergency overflows – South West Water and Southern Water request that it be extended to any additional work required by Defra under the U_MON6 WINEP driver on MCERTS certified monitoring of emergency overflow operation on network sewage pumping stations, to cover changes to Government requirements relating to Emergency overflows, beyond the monitoring proposals included in the PR24 final determination.

Investigations – United Utilities request that it include additional investigation requirements, such as the revision of SOAF; Yorkshire Water request that it is expanded to include any statutory requirement on storm overflows triggered by the Environment Agency or Defra not limited to storm overflow improvements, giving the example of additional investigations.

Requirement to overspend – Yorkshire Water set out that in its view, the relative over or underspend of the existing programme should not impact on whether additional funding is allowed for new obligations. The mechanism as proposed may fail to reward companies that deliver efficient alternative solutions, simply because they are subject to external additional obligations outside of their control. The storm overflow uncertainty mechanism, as currently designed, would interact adversely with the cost-sharing incentives for delivering efficient solutions and this would not be in customers' long-term interests. They recommend that the requirement for a company to have overspent is removed.

Broader remit – Thames Water agrees that there should be a route to additional funding, but requests that it be drawn more broadly to include new requirements that have to be delivered before 2030, or a new post 2030 requirement that requires additional expenditure in AMP8, or there is an acceptance that new work will be factored into the PR29 process and does not have to be delivered until AMP9. South West Water requests that the definition is expanded to include but not limited to the Defra 2027 review of Storm Overflow Discharge Reduction Plans. Where companies identify additional schemes required under UWWTR requirements, to meet newly designated bathing waters, or due to revision of the SODRP, these will qualify for this Notified Item (South West Water). Thames Water requests changes in requirements from investigations should be included within the uncertainty mechanism – where companies need to go beyond 10 spills. They welcome the inclusion of Bathing Waters but state that as set out this does not appear to apply to disinfection of final effluents.

Our assessment and reasons

New standards – we reject the expansion of the storm overflow uncertainty mechanism due to new standards coming from the ongoing enforcement activities. Our enforcement activities relate to existing legal obligations and does not impose new standards. The storm overflow uncertainty mechanism allows for companies to request additional funding for the

outcome of any UWWTR improvements that go beyond current permit requirements. We will not provide enhancement funding for companies to meet existing permit requirements.

Post AMP8 adjustment mechanism – We reject the inclusion of a Post AMP8 adjustment instead of PCDs, as proposed by South West Water. The PCD approach provides greater cost certainty to customers and encourages companies to provide accurate estimates of forecast costs, while cost sharing and the uncertainty mechanism provide additional protection should outturn costs vary from forecast. An ex-post adjustment based on outturn costs will increase complexity and uncertainty for companies and their customers.

Bathing Waters – We reject the extension of the uncertainty mechanism to additional work associated with new bathing water designations. The uncertainty mechanism includes provision for additional storm overflow schemes related to newly designated bathing waters. We reject the inclusion of final effluent treatment within the storm overflows uncertainty mechanism. The inclusion of storm overflows in the uncertainty covers the majority of the risk/cost that is likely to be incurred by companies for new bathing water designations. We have included additional funding for microbiological treatment from new bathing water designations in the final determinations. Broader risk can be managed through the cost sharing mechanism.

Emergency overflows – we reject the inclusion of emergency overflows as part of the storm overflow uncertainty mechanism. We have provided funding for the current level of monitors included within the WINEP, we are not aware of any plans to extend the scope/scale of the current programme. We consider compliance with the existing permits is covered by base expenditure allowances.

Investigations – We accept that companies may need to deliver additional storm overflow investigations linked to the new SOAF2 guidance, and that the scale of this is not currently certain. We therefore propose to extend the uncertainty mechanism to capture these additional investigations, providing the original investigation allowances are fully spent.

Requirement to overspend – We reject the proposal to remove the requirement that companies need to have overspent before allowing additional expenditure allowances through the uncertainty mechanism. We do not consider that companies should be requesting additional expenditure allowances where they have not fully spent existing allowances. This will reduce public trust and confidence in the sector. We expect companies to go further in addressing storm overflows where funding is available. We expect companies to ensure that they are efficient in delivering the assigned enhancement allowance before requesting additional funding.

Broader remit – We reject the proposal for broadening the remit of the storm overflow uncertainty mechanism. The storm overflow price control deliverable already provides companies with significant flexibility to change the type and scale of storage solutions for individual schemes and allows companies to vary the location of schemes. This together with

the storm overflow uncertainty mechanism provides companies with significant flexibility to deal with changes within period.. It is for companies to effectively plan and forecast the required scope and expenditure as part of the Price Review process. Cost sharing is in place to share cost risk between companies and customers for less material risks which incentivises companies to deliver efficiently.

Our final determination

At final determination we have set out funding for 2,884 storm overflow spill reduction schemes, however we recognise that there is uncertainty over the number of storm overflow schemes that may be required in the 2025–30 period.

This is due to:

- **Improvements required to meet Urban Waste Water Treatment (England and Wales) Regulations 1994 (UWWTR):** While some proposed storm overflow schemes are the result of investigations in the 2025–30 period, some are dependent on the outcome of investigations in the 2025–27 period. Some of these investigations may lead to some storm overflow schemes no longer being required and some may lead to new storm overflow schemes being required. If investigations lead to storm overflow scheme requirements related to the UWWTR then the Environment Agency expects these to be completed as soon as possible, and no later than three years after the completion of the investigation.
- **Future designation of Bathing Waters:** Bathing Waters are designated in May each year by Defra, with the first year's classification results published in November each year. Companies should now be aware of this year's designations, and we expect new/revised WINEP/NEP schemes required as a result to be included in responses to the draft determination. Bathing Waters in Wales are designated by Welsh Government. However, we recognise that there may be a need for new storm overflow schemes in the 2025–2030 due to future designations.
- **Defra's review in 2027 of the Storm Overflows Discharge Reduction Plan:** In the Storm Overflows Discharge Reduction Plan (SODPR), the Secretary of State set out that there was a need to be careful of the impact of storm overflow investment on water bills, and if we can go faster, we will, with a mandatory review in 2027 to see if we can go further.²⁵⁸ There is uncertainty around the impact of this review and whether it could lead to a requirement for further investment on Storm Overflows in the 2025–2030 period.
- **Additional investigations:** Revision of the SOAF guidance/process, may lead to a significant change in the storm overflow investigations required to be delivered before 2030.

²⁵⁸ [Storm Overflows Discharge Reduction Plan \(publishing.service.gov.uk\)](https://publishing.service.gov.uk), September 2023, p7.

Our approach to setting price control deliverables provides companies with flexibility to switch the location of schemes, by holding companies to account for the number of schemes and total volume of equivalent storage delivered. This will allow companies to swap in and out schemes if required during the price control period. We expect all companies to maximise the delivery of storm overflow schemes within the period. Where companies identify additional schemes required under UWWTR requirements, to meet newly designated bathing waters, or due to revision of the SODRP, and it is not possible to swap out existing schemes, we propose to include an uncertainty mechanism. This will provide additional funding for companies through the PR24 reconciliation at PR29, if companies have delivered additional storm overflow schemes and storage in the 2025–30 period and have overspent storm overflow storage scheme allowances. This will apply solely to grey/hybrid scheme allowances, giving companies the flexibility to choose nature-based solutions.

For storm overflow investigations, given the uncertainty over the number of storm overflow investigations that may be required from the SOAF2 guidance, the uncertainty mechanism will provide additional funding subject to companies having delivered all of their existing investigations and spent all existing funding for investigations. Additional funding will be provided on the same average cost per storm overflow investigation rate as funded in PR24, although we reserve the right to use companies' outturn costs to determine the funding for additional storm overflow investigations that are not covered by the allowances for the existing investigation programmes, if outturn unit costs are significantly lower than assumed as part of PR24.

4.7.6 Third-party services reconciliation mechanism

What we said in our draft determinations

We proposed a third-party services end-of period cost reconciliation mechanism to allow companies to recover efficient expenditure if outturn activity is different to forecast. This will include third-party services governed by the price control, water diversions under section 185 of the Water Industry Act 1991 (water section 185 diversions), and water and wastewater diversions not requested under section 185 of the Water Industry Act 1991.

In the PR24 end-of-period reconciliation, we will adjust companies allowed expenditure based on the difference between outturn and allowed expenditure included in the third-party services reconciliation mechanism. This will continue to incentivise companies to set cost reflective charges, allow companies to recover efficient expenditure, and allow customers to benefit if outturn revenue is greater than expenditure.

We will require water companies to provide sufficient and convincing evidence that their costs are efficient in the end-of-period reconciliation. We retain the option to disallow an adjustment where cost efficiency is not demonstrated. This will incentivise water companies

to deliver third-party services, water section 185 diversions, and water and wastewater non-section 185 diversions efficiently.

In August 2024 we published a draft reconciliation model.

Stakeholders' representations

We received eight responses to our draft reconciliation model.

United Utilities, Severn Trent Water and Wessex Water disagreed with our proposal to only allow 'efficient' costs as this could lead to unpredictable ex-post adjustments and many of the agreements were commercial in nature or the charging rules should create parity between costs and revenue.

Companies also raised concerns over potential asymmetry in the mechanism, where we would not adjust expenditure allowances if third party services revenue was less than costs. Northumbrian Water and South West Water suggested that costs in excess of the forecast should be allowed to the extent that revenues similarly increase. Anglian Water noted that it was not always possible to recover 100% of the costs within the price review period due to the slow nature of some development build outs.

South West Water claimed that using the comparison of actual costs to third-party price control revenue as a binary indicator in the reconciliation model gives a distorted result for even a small amount of excess expenditure and that a taper type adjustment would mitigate this. Dŵr Cymru expressed concern that the end-of-period adjustment could be in conflict with the incentive for an in-period adjustment used by the revenue forecasting incentive.

We also received minor comments about the scope of the mechanism and the published draft reconciliation model.

Our assessment and reasons

We do not agree that expenditure allowances should be automatically adjusted for outturn costs where they have not been recovered through corresponding revenue. We will restrict cost adjustments where revenue has been recovered from the third-party services customers. Companies must explain any variations between forecast and outturn third-party services costs in annual performance report commentaries.

Given the relatively small size of third-party activities, we do not propose to introduce taper type adjustments as this would not be proportionate. We retain flexibility within the RFI, which allows companies to make a case for exceptional circumstances to be considered in the PR24 end-of-period reconciliation.

The reconciliation will be restricted to price control activities only. For the avoidance of doubt the price control activities are:

- non-potable supplies,
- rechargeable works,
- s185 diversions (water only); and
- non-s185 diversions (including NRSWA diversions).

Our final determination

We retain our draft determination proposal for a third-party services end-of period cost reconciliation mechanism. This will adjust companies allowed expenditure based on the difference between outturn and allowed expenditure included in the third-party services reconciliation mechanism in the PR24 end-of-period reconciliation. We will consult on the application of this reconciliation as part of the PR24 reconciliation rulebook.

4.7.7 Bespoke cost uncertainty mechanisms

What we said in our draft determinations

Companies submitted bespoke uncertainty mechanisms in their business plans where they considered existing uncertainty mechanisms (for example cost sharing and interim determinations) do not provide sufficient protection if a risk materialises.

We set a high evidential bar for accepting bespoke uncertainty mechanisms or notified items.²⁵⁹ ²⁶⁰ Such mechanisms reallocate risk from companies to customers, and companies already benefit from a suite of risk sharing and reconciliation mechanisms that provide significant protection for customers.

To assess company claims for bespoke uncertainty mechanisms, we considered whether the issue is material; the extent to which management can control the risk or the impact of that risk; and whether the proposed uncertainty mechanism helps to support policy objectives, improves precision of cost allowances, is proportionate and protects the interests of customers.

²⁵⁹ Ofwat, 'Creating tomorrow, together: our final methodology for PR24', December 2022, pp.98.

²⁶⁰ A "notified item" is an item we specify that has not been allowed for (either in full or not at all) in our price control determination. Notified items are (together with the relevant changes of circumstance specified in company licences) eligible for consideration as part of an interim determination.

We concluded there was no need to introduce any bespoke uncertainty mechanisms at draft determinations. Most uncertainty mechanisms proposed by companies were either not required because the uncertainty reduced since original business plan submissions, or were covered by sector wide uncertainty mechanisms. The remaining uncertainty mechanism proposals did not pass the criteria in our PR24 methodology.

Stakeholders' representations

Anglian Water withdrew its request for a boundary box replacement uncertainty mechanism, and instead requested it as a base cost adjustment claim. But Southern Water proposed a boundary box replacement uncertainty mechanism in its draft determination representation.

Most companies proposed an uncertainty mechanism to allow companies to recover efficient expenditure associated with more requirements related to PFAS that are introduced in the next five years. PFAS refers to a large family of chemicals and more scientific information has emerged about them over recent years. This has led to regulators updating approaches for managing risks to human health and the environment posed by PFAS, including drinking water supplies and effluent discharges. Water companies commissioned a report from Jacobs to assess options to address this uncertainty at PR24. Options assessed include interim determinations, notified item, bespoke uncertainty mechanisms, but no recommendation was made.

Wessex Water proposed several additional uncertainty mechanisms to address uncertainty that it thinks is not addressed through existing mechanisms:²⁶¹

- **Lead pipe replacement** – the company identifies a change in Drinking Water Inspectorate guidelines and associated legislation on their expectation for water companies to achieve a 'lead free' network. It therefore proposes a asset-linked volume driver that would allow it to replace more lead pipes than it included in draft determination representations.
- **New permitting at water supply sites** – the company states that the Environment Agency has indicated the wish to implement new permitting for run to waste and sludge disposal at water supply sites. The company says the cost would vary by individual site, but could be in the region of tens of millions. The company proposes either a targeted reopener or asset-linked volume driver. South East Water identified the same risk and asked Ofwat to allow revenue to be adjusted within the AMP if materially higher costs are incurred.
- **Trunk main flow balance requirements** – the company states that Ofwat has indicated the use of the burst and background estimates (BABE) approach to trunk main leakage reporting should be phased out by PR29. It expects this change will lead to some tens of

²⁶¹ Excluding PFAS and bioresources proposals, which we have assessed above.

millions pounds of investment. The company proposes a targeted reopener or asset-linked volume driver.

- **Pollution incidents** – the company states the Environment Agency could amend the definition of a pollution incident for the purposes of its performance commitment. For example, by including category 4 pollution incidents. Wessex Water considers this will affect its ability to achieve the 2025–30 performance commitment for pollution incidents. The company proposes a targeted reopener.
- **Emergency overflows** – the company states that Defra has confirmed it is likely to require monitors to be installed at 100% of emergency overflows by 2035. It therefore says that Defra is considering a 50% commitment by 2030 instead of the current commitment of 25% by 2030. It says this will increase costs relating to emergency overflows beyond those included in the company's draft determination representation. The company proposes an asset-linked volume driver. Southern Water raised the same uncertainty and proposed including in the storm overflows uncertainty mechanism.
- **Inland bathing water** – Defra designated 3 new sites as bathing waters in the Wessex Water region. These will be subject to Environment Agency monitoring to determine a classification ranging from poor to excellent. This could lead to WINEP actions (BW_IMP1 and BW_IMP2) and the additional costs that come with those. The company proposes a targeted reopener or asset-linked volume driver.
- **Poole Harbour** – the company states that the Environment Agency has recently added another line into the WINEP for storm overflow improvements in Poole Harbour to achieve shellfish waters improvements. The required improvement outputs are not confirmed. The company states this could require a material increase in investment above what has been estimated, including significant infiltration sealing. The company included 'no regrets' schemes in its costs. It proposes an uncertainty mechanism based on Ofwat's PR24 storage model.

Anglian Water highlight uncertainty regarding Thurne section 101A first time sewerage scheme. The scheme will cost £35 million for 60 properties. Anglian Water have not included costs in their plan. But argue that the scale of expenditure risk will need to be reflected in final determinations, either through the allowance or an ability to recover the revenue if expenditure should be incurred.

Our assessment and reasons

We retain our draft determination view that most uncertainty mechanisms proposed by companies are not required because the uncertainty is mitigated through our cost assessment approach or sector wide uncertainty mechanisms we have introduced at PR24, which include:

- introduction of cost sharing for the bioresources price control;
- enhanced cost sharing rates for enhancement, bioresources IED enhancement and environmental permitting regulation (EPR) permit costs, continuous water quality monitoring and investigations costs, large enhancement schemes above £100 million in value, business rates, and abstraction charges and discharge consents;
- real price effect ex-post true-ups for labour (base and enhancement), energy (wholesale base), and materials plant and equipment (enhancement);
- price control deliverables;
- our approach to funding large schemes and strategic resource options;
- our delivery mechanism for Southern Water and Thames Water;
- inclusion of a storm overflow uncertainty mechanism; and
- a notified item for bioresources in relation to increases in bioresources costs over the 2025–26 to 2029–30 period because of changes in relation to the application to agricultural land of fertiliser derived from sludge from:
 - any new, changed legal requirements; or
 - any new or changed statutory guidance or direction from Defra or the Welsh Government to the Environment Agency or Natural Resources Wales

For final determinations, we also propose to introduce notified items and a bespoke interim determination process for PFAS and cyber security following consideration of draft determination representations. Further details are provided in 'PR24 final determinations: In-period adjustments' appendix.

The major projects uncertainty mechanism and the Havant Thicket uncertainty mechanism for Southern Water are detailed in 'PR24 final determinations: Major projects development and delivery' appendix.

None of the remaining uncertainty mechanisms proposed by water companies in their draft determination representations pass the criteria in our PR24 methodology, as detailed below.

Table 44: Bespoke uncertainty mechanisms proposed in business plans

Company	Company proposal	Ofwat assessment
Southern Water	Proposed mechanism funds boundary box replacements in excess of the level included in its business plan.	Reject. Replacement of boundary boxes already covered through metering sector wide cost adjustment and accompanying PCD.

		The unit rate used to determine the cost adjustment reflects a mix of meter replacement work based on assumptions made in company's business plan. Cost sharing sufficiently mitigates the risk that companies need to deliver a more or less complex mix of work than forecast.
Wessex Water	Lead pipe replacement – asset linked volume driver uncertainty mechanism	Reject. The issue is not bespoke to Wessex Water but no other company has raised this as a risk. The risk is immaterial in respect to overall total expenditure allowances, and companies can recover 60% of any overspend on enhancement from customers.
Wessex Water South East Water	New permitting at water supply sites – a targeted reopener or asset-linked volume driver uncertainty mechanism	Reject. The risk is likely to be immaterial in respect to overall total expenditure allowances, and companies can recover 60% of any overspend on enhancement from customers.
Wessex Water	Trunk main flow balance requirements – a targeted reopener or asset-linked volume driver	Reject. The issue is not bespoke to Wessex Water and companies could have requested expenditure allowances in business plans. In addition, the additional costs are likely to be immaterial relative to overall total expenditure allowances.
Wessex Water	Environment Agency amend definition of a pollution incident for the purposes of its performance commitment – targeted reopener	Reject. We will revisit pollution incidents performance commitment levels if the Environment Agency amends the definition of a pollution incident for the purpose of its performance commitment.
Wessex Water Southern Water	Monitors to be installed at 50% of emergency overflows instead of 25% – asset linked volume driver or storm overflows uncertainty mechanism	Reject. We have made an allowance for installation at 50% of sites. The residual risk is immaterial in respect to overall total expenditure allowances, and companies can recover 60% of any overspend on enhancement from customers.
Wessex Water	New designated Inland bathing waters lead to additional WINEP actions – targeted reopener or asset-linked volume driver	Reject. The residual risk is immaterial after accounting for the storm overflows uncertainty mechanism and cost sharing that allows companies to recover 60% of any overspend on enhancement from customers.
Wessex Water	Storm overflow improvements in Poole Harbour to achieve shellfish waters improvements – uncertainty mechanism based on Ofwat's PR24 storage model.	Reject. Wessex Water included 'no regrets' costs in its draft determination representation, which we have provided an allowance for. Any residual risk that costs are higher than forecast is sufficiently mitigated through cost sharing, which allows companies to recover 60% of overspend on enhancement from customers. The existing storm overflow uncertainty mechanism.
Anglian Water	Thurne section 101A first time sewerage scheme – commitment to allow costs if they materialise	Reject. The risk is immaterial after accounting for cost sharing, which allows companies to recover 60% of overspend on enhancement from customers.

Our final determination

For final determinations, we propose to introduce notified items and a bespoke interim determination process for PFAS and cyber security following consideration of draft determination representations. Further details are provided in 'PR24 final determinations: In-period adjustments' appendix.

We retain our draft determination proposal not to accept any company proposals for bespoke uncertainty mechanisms. Most uncertainty mechanisms proposed by companies are not required because the uncertainty is mitigated through our cost assessment approach or sector wide uncertainty mechanisms. The remaining uncertainty mechanism proposals do not meet the criteria set out in the PR24 methodology for the reasons set out above.

4.8 Monitoring delivery

We want to strengthen our monitoring of delivery at PR24. Companies have to deliver a significant step up in investment compared to PR19. Given the deliverability challenges that companies are likely to face we are enhancing the transparency of what companies will deliver and increase the frequency at which we collect delivery data.

We will continue to work alongside other regulators, including the Environment Agency and Natural Resources Wales, to make sure we minimise the duplication of information requested and to share information of joint interest.

4.8.1 Delivery plan

What we said in our draft determinations

In our PR24 draft determinations we proposed to require all companies to publish a delivery plan showing PCD output targets for each year over the 2025-30 period and interim milestones for PCDs where the profile of delivery is back-ended. We proposed to require companies to publish a delivery plan in April/May 2025 and an independently assured delivery plan in July 2025.

Stakeholders' representations

We received representations on this proposal from Thames Water and Wessex Water. Both companies request further detail on the information the delivery plan should include and the format in which this information should be provided. Wessex Water asks for further clarity on how information on interim milestones will be used.

Wessex Water also requests clarification on which delivery plan should be the initial baselined plan, whether the unassured April/May plan or the assured July plan.

Our assessment and reasons

We have considered the feedback from stakeholder representations.

We will provide further guidance on the information and format of this information that we expect companies to provide through the delivery plan in February 2025. Our current expectation is for delivery plans to provide the following key information for each enhancement scheme:

- Scheme ID
- Enhancement area
- Original and current regulatory date (where relevant)
- Target scheme completion date
- Stage gate target completion dates (where relevant)
- Scheme cost
- % of spend to date

We expect the April/May delivery plan to be a draft plan. We will then provide companies with feedback ahead of them publishing a final independently assured delivery plan in July 2025. We expect this final July plan to set the baseline for progress reporting during the 2025–30 period.

We will use the information on interim milestones to track company progress on delivery across the 2025–30 period. This will allow us to have early sight of delivery challenges that companies may face during the initial years of PR24.

Our final determination

We retain our proposal in draft determinations to require all companies to publish a delivery plan in April/May 2025 and an independently third-party assured delivery plan in July 2025.

We will provide further guidance on the information and format of this information to be provided through the delivery plan in February 2025.

4.8.2 Delivery plan progress report

What we said in our draft determinations

In our PR24 draft determinations we proposed to require all companies to submit a delivery plan progress report. This report should set out the progress made against the delivery plan targets. It should also set out forecast of delivery against delivery plan targets for each of the remaining years of the 2025–30 period. We proposed to require companies to submit this report on a six-monthly basis in the months of October/November and April/May. We also proposed to require companies to submit an independently assured version of the April/May report in July of each year. We proposed more frequent and detailed reporting for Thames Water and Southern Water.

Stakeholders' representations

Five companies²⁶² disagreed with our proposal to require companies to report progress against the delivery plan on a six-monthly basis. They state that this will be too onerous for companies and Ofwat. Severn Trent Water asks for the half-year report to be required for poor performing companies only. It states that this would further enhance the incentives to deliver on a timely manner. Wessex Water asks for the half-year report to be limited to time-related incentive areas. It also refers to Ofgem's approach which consisted of annual reporting, with further reporting where a PCD delivery date is not met.

Our assessment and reasons

We want to have sight of any delivery challenges facing companies early in the period. Given the size of the PR24 capital programme and the concerns we have around the delivery of this programme we consider that six-monthly reporting would be appropriate and proportionate. The additional costs from this will be small compared to the £44 billion enhancement programme. Six-monthly reporting will allow us to act in an agile way to any delivery challenges arising during the period and work with companies to resolve these challenges. We consider that requiring this frequency of reporting to all companies is important to set a baseline to compare companies across all areas of enhancement expenditure. Therefore we reject calls to limit the six-monthly reporting to a subset of expenditure areas.

The six-monthly reporting will be particularly important for the initial years of the 2025–30 period. After these initial years we will consider whether the six-monthly reporting is no longer required for companies showing good progress on delivery. We will consider this as part of our annual assessment of progress against delivery plans.

Our final determination

We retain our draft determination proposal to require all companies to submit a delivery plan progress report on a six-monthly basis (in October/November and April/May). Companies should submit the first six-monthly report in October/November 2025. After the initial years of the period, we will consider whether this six-monthly reporting is no longer required for companies showing good progress on delivery. We will do this as part of our annual assessment of progress against delivery plans.

We also retain our proposal for companies to publish an independently assured version of the April/May report in July of each year. Companies should publish the first independently assured report in July 2026.

²⁶² Anglian Water, Dwr Cymru, Hafren Dyfrdwy, Severn Trent and Wessex Water

We will provide further guidance on the information and format of the six-monthly and annual reports in early 2025.

4.8.3 WINEP and NEP delivery monitoring

What we said in our draft determinations

In our PR24 draft determinations we said that we are collaborating with the Environment Agency, Natural England, Natural Resources Wales, and water companies to develop a Delivery Monitoring Framework (DMF) for the 2025–30 Water Industry National Environment Programme (WINEP) in England and the National Environment Programme (NEP) in Wales.

Stakeholders' representations

We did not receive representations on this area.

Our final determination

We will continue collaborating with the Environment Agency, Natural England, Natural Resources Wales, Defra and water companies to develop a Delivery Monitoring Framework (DMF) for the 2025–30 Water Industry National Environment Programme (WINEP) in England and the National Environment Programme (NEP) in Wales. This will improve regulatory oversight and highlight deliverability issues earlier in the 2025–30 investment period.

By putting this new framework in place, we aim to improve tracking of investment, hold companies to account on the timely delivery of WINEP and NEP actions, and ensure benefits are delivered for the environment and for customers. This is part of our wider effort to encourage delivery of the PR24 programme in all areas of water companies' business plans.

Where WINEP and NEP actions are linked to PCDs, we will use the DMF to track company progress towards meeting them. This will ensure that regulators have a single source of data for monitoring water company delivery of the WINEP and NEP. This process also aims to reduce the administrative burden on regulators and water companies by using a single data collection and reporting tool.

We expect the DMF and associated reporting tools to be in place for the start of 2025–30 period and will look to review and improve the system where necessary as it matures.

It is the responsibility of water companies to manage their programmes to ensure timely delivery of both PCD targets and WINEP/NEP delivery deadlines.

4.8.4 More granular data on base expenditure and outputs

What we said in our draft determinations

We said we are considering collecting more granular data on base expenditure and associated outputs. This would allow us to better understand what companies are delivering for customers and the environment with base expenditure allowances. And will also allow us explore more granular cost benchmarking at future price reviews.

We invited stakeholder comments and suggestions on our initial ideas for more granular reporting:

- Collection of replacement and/or refurbishment expenditure and workload / output data for different assets.
- More detailed understanding and breakdown of overhead / indirect costs.

Following publication of our draft determinations, we engaged with water companies through the PR24 query process to collect additional data on capital maintenance expenditure, workloads / outputs, and asset condition data.

Stakeholders' representations

Yorkshire Water support the provision of more granular base cost data. It thinks this will allow a better understanding of what water companies are spending money on. But do not support providing operating costs by performance driver / activity where opex and performance do not have a 1:1 relationship.

Yorkshire Water proposes that other operating expenditure is broken down into the following categories:

- Chemicals
- Asset maintenance
- Other operational operating costs
- Cost of regulation
- Insurance
- Support functions and overheads
- Recharges between price controls

We received no further stakeholder representations on our proposals.

Our assessment and reasons

In section 2.4, we set out our plan to improve understanding of asset condition in the water sector during the 2025-30 period. To achieve this, we will need to collect comparable data

across water companies on asset condition, capital maintenance spend, and asset renewals / refurbishment workload data over the next two years. We will work closely with the sector to achieve this.

We also intend to collect more granular data on overhead costs and 'other operating expenditure', and welcome the constructive suggestions from Yorkshire Water on this. We will consult on potential changes to annual performance report reporting requirements and guidance in 2025.

Our final determination

We will engage and consult with the sector on more granular base expenditure reporting following PR24 final determinations. This will allow us to better understand what companies are delivering for customers and the environment with base expenditure allowances, and hold companies to account for key base expenditure outputs (for example asset renewals). It will also allow us explore more granular cost benchmarking at future price reviews.

5. Expenditure allowances for final determinations

The previous sections describe our approach to setting efficient base and enhancement expenditure allowances for PR24 final determinations. This section brings everything together to summarise total efficient expenditure allowances across the sector for the 2025–26 to 2029–30 period. The remainder of this section is structured as follows:

- Base, enhancement and total expenditure allowances before the application of frontier shift efficiency and real price effects, all in 2022–23 prices.
- Base, enhancement and total expenditure allowances after the application of frontier shift efficiency and real price effects, all in 2022–23 prices.

In developing our final determination expenditure allowances, we have identified a limited number of small errors in our final determination feeder models where we have been unable to make corrections ahead of publication. We have identified these errors in the cover sheet of the model. Our 'Notification of the PR24 final determination of price controls' document for each company includes a factor that will allow us to make corrections for unambiguous errors within our blind year reconciliation. We followed a similar process in PR19.²⁶³

5.1 Expenditure allowances before the application of frontier shift efficiency and real price effects

This section summarises the outcome of our cost assessment after applying the catch-up efficiency challenge (discussed in section 2 and 3), but before the application of frontier shift efficiency and real price effects. Allowances include potential allowances that could be allowed through the large scheme gated process and delivery mechanism. Company view of costs is based on their draft determination representations and includes transition funding (including investment requested through the accelerated infrastructure delivery project).

5.1.1 Capping allowances

What we said in our draft determinations

Our benchmark models do not set the efficient cost benchmark at the most efficient company. They are either set on upper quartile or average costs. This means that in some enhancement models companies are more efficient than our benchmark, and in some enhancement areas they will be less efficient than our benchmark. Necessarily there will be trade-offs between individual areas as it is unlikely that a company will be more efficient than our benchmark in all areas of water or wastewater enhancement expenditure.

²⁶³ Ofwat, [Approach to PR19 Blind year adjustments for 2019–20 performance](#), July 2020.

At draft determinations, we intervened in exceptional cases where our view of efficient expenditure was more than 20% higher than the amount the company requested in its business plan. In these cases, we capped the allowance at 120% of the company's business plan proposal. This rewards companies that submitted an efficient business plan, which is important as these companies help to set a stretching but achievable cost benchmark and prevent customers paying for inefficiency. It also incentivises companies to submit efficient business plans at future price reviews to the long run benefit of customers. At the same time, it protects the interests of customers of efficient companies.

This capping approach was higher than at PR19, where we capped enhancement expenditure allowances at business plan requested costs, and capped base expenditure allowances at 105% of business plan requested costs. It also allowed potential greater outperformance than Ofgem's most recent gas distribution price control, where allowances were capped at business plan proposals.²⁶⁴

We did not apply the cap at a granular cost assessment level (for example each enhancement area) as companies can be efficient in some areas and less efficient in other areas and this allows trade-offs across different cost areas. We assessed the need to cap allowances at the following level of cost aggregation:

- **Wholesale water modelled base costs** – No cap applied.
- **Wastewater network plus modelled base costs** – No cap applied.
- **Bioresources modelled base costs** – 120% cap applied to Severn Trent Water and Hafren Dyfrdwy allowance.
- **Residential retail base costs** – No cap applied.
- **Water enhancement.** WINEP / NEP – 120% cap applied to Hafren Dyfrdwy, Bristol Water and SES Water allowance. Supply demand balance and metering – 120% cap applied to Hafren Dyfrdwy and South Staffs Water allowance. Water quality improvement programme – no cap applied.
- **Wastewater enhancement.** WINEP / NEP – 120% cap applied to Anglian Water allowance.

We said we would revisit our capping approach at final determination.

²⁶⁴ Ofgem, 'RIIO-2 Final Determinations for Transmission and Gas Distribution network companies and the Electricity System Operator', 'Final Determinations: Technical Annex part two', December 2020.

Stakeholders' representations

Portsmouth Water and SES Water do not agree with capping in principle as they think it could lead to unbalanced outcomes. But Portsmouth Water support a 120% cap if a cap is imposed.

Severn Trent Water and Hafren Dyfrdwy disagree with capping bioresources base expenditure allowances as they consider the IED reallocation from base to enhancement was applied incorrectly. They also consider we should apply the cap on a post frontier shift efficiency and real price effects basis.

Our assessment and reasons

We retain our draft determination position to cap allowances at 120% of company requested costs. This strikes the right balance between rewards companies that submitted an efficient business plan, whilst protecting the interests of customers of efficient companies. It is also leads to a higher reward for efficient business plans that at PR19 and in the most recent Ofgem electricity and gas distribution price controls.

On the Severn Trent Water and Hafren Dyfrdwy issue, following careful consideration we do not make the IED reallocation from base to enhancement at final determination. We subsequently do not cap Severn Trent Water's and Hafren Dyfrdwy's bioresources base expenditure allowance as it is not more than 120% of requested costs.

Our final determination

We retain our draft determination position and intervene in exceptional cases where our view of efficient expenditure was more than 20% higher than the amount the company requested in its draft determination representation. In these cases, we capped the allowance at 120% of the company's draft determination representation.

We assessed the need to cap allowances at the same level of cost aggregation we applied at draft determinations. As a result of companies' increasing requested costs in draft determination representations, the cap has only reduced allowances in one area:

- **Wholesale water modelled base costs** – No cap applied.
- **Wastewater network plus modelled base costs** – No cap applied.
- **Bioresources modelled base costs** – No cap applied
- **Residential retail base costs** – No cap applied.
- **Water enhancement.** Supply demand balance and metering – 120% cap applied to Hafren Dyfrdwy, Yorkshire Water, and South Staffs Water allowances.

- **Wastewater enhancement.** No cap applied.

We are concerned by the unprecedented increase in company requested costs between original business plan submissions and draft determination representations. Particularly increases not driven by statutory requirements. We will explore how to mitigate this at PR29.

5.1.2 Overall allowances

In summary:

- **Totex allowances (base + enhancement)** – we allow £105.8 billion of expenditure, including contingent allowances. This is 7 percent below companies' requested expenditure in draft determination representations of £113.7 billion, and 16 percent higher than our draft determination totex allowances.
- **Base expenditure allowances** – we allow £61.4 billion. This is 4 percent below companies' requested base expenditure in draft determination representations of £64.1 billion, and 9 percent higher than our draft determination base expenditure allowances.
- **Enhancement expenditure allowances** – we allow £44.5 billion. This is 10 percent below companies' requested enhancement expenditure of £49.6 billion, but 29 percent higher than our draft determination enhancement expenditure allowances.

Table 45: Base allowances – before frontier shift efficiency and real price effects – £million 22-23 prices²⁶⁵

Company	Modelled base costs + cost adjustments				Unmodelled base costs									Total base allowance
	Water	Wastewater network plus	Bioresources	Residential retail	Business rates	Abstraction charges	TMA costs	Lane rental permit costs	IED opex	DS and diversions (exc. Network reinforcement)	Third-party services (exc. diversions)	Discharge consents	Non-household retail	
Anglian Water	2,087.86	2,071.63	431.17	517.34	468.14	52.90	7.78	0.00	2.65	225.39	173.39	82.68	0.00	6,120.93
Dŵr Cymru	1,371.20	1,224.95	225.67	301.95	190.47	49.52	0.32	0.00	0.12	143.52	94.34	36.72	28.58	3,667.35
Hafren Dyfrdwy	149.78	26.95	3.67	14.97	5.82	4.08	0.00	0.00	0.00	4.94	8.17	0.52	2.13	221.04
Northumbrian Water	1,544.26	862.55	170.07	335.25	210.85	237.82	2.53	0.00	0.00	62.67	152.65	35.56	0.00	3,614.20
Severn Trent Water	3,075.05	2,797.22	615.97	752.70	596.07	76.73	15.05	0.00	1.18	471.49	40.20	112.39	0.00	8,554.05
South West Water	924.09	745.31	152.45	179.12	167.55	30.89	0.62	0.00	2.07	71.01	5.90	47.20	0.00	2,326.19
Southern Water	997.61	1,957.29	265.08	368.12	228.72	19.86	12.23	5.03	0.00	117.17	70.54	38.04	0.00	4,079.68
Thames Water	5,106.31	4,038.46	772.67	1,061.26	922.63	117.37	158.93	6.40	0.26	307.04	37.90	45.51	0.00	12,574.75
United Utilities	2,635.44	2,587.63	467.79	671.29	516.71	118.18	11.16	2.27	2.88	447.15	18.29	65.72	0.00	7,544.52
Wessex Water	568.04	1,026.31	182.99	205.68	147.61	13.95	0.55	0.00	0.00	41.99	7.54	37.09	0.00	2,231.74
Yorkshire Water	2,030.16	1,963.86	392.00	458.04	341.11	52.97	18.83	4.86	0.66	140.44	17.62	58.12	0.00	5,478.68
Affinity Water	1,322.91	0.00	0.00	172.94	100.86	32.53	3.23	0.07	0.00	52.61	15.25	0.00	0.00	1,700.41
Bristol Water	443.92	0.00	0.00	66.51	35.77	12.94	0.93	0.00	0.00	18.01	7.85	0.00	0.00	585.92
Portsmouth Water	201.95	0.00	0.00	28.60	13.43	8.09	2.44	1.01	0.00	10.44	1.97	0.00	0.00	267.93
South East Water	932.94	0.00	0.00	110.25	104.55	21.60	6.38	2.24	0.00	102.19	1.44	0.00	0.00	1,281.60
South Staffs Water	574.56	0.00	0.00	77.31	26.96	22.89	2.45	1.27	0.00	62.93	10.92	0.00	0.00	779.28
SES Water	244.96	0.00	0.00	39.38	20.82	5.13	1.58	0.00	0.00	13.30	3.02	0.00	0.00	328.17
Total	24,211.04	19,302.16	3,679.54	5,360.71	4,098.06	877.43	245.00	23.15	9.80	2,292.31	666.97	559.54	30.72	61,356.44

²⁶⁵ Excludes pension deficit recovery payments and equity issuance costs.

Table 46: Base allowances versus requested – before frontier shift and real price effects – £million 22-23 prices²⁶⁶

Company	Modelled base costs + cost adjustments				Unmodelled base costs				Total base costs			
	Company proposal	Our view	Our view minus company proposal		Company proposal	Our view	Our view minus company proposal		Company proposal	Our view	Our view minus company proposal	
			£m	% of company proposal			£m	% of company proposal			£m	% of company proposal
Anglian Water	5,539.25	5,108.00	-431.25	-0.08	925.65	1,012.93	87.27	0.09	6,464.91	6,120.93	-343.98	-5%
Dŵr Cymru	3,028.28	3,123.77	95.48	0.03	491.10	543.58	52.48	0.11	3,519.39	3,667.35	147.96	4%
Hafren Dyfrdwy	210.21	195.37	-14.84	-0.07	25.48	25.66	0.18	0.01	235.69	221.04	-14.66	-6%
Northumbrian Water	3,141.13	2,912.12	-229.01	-0.07	759.30	702.08	-57.22	-0.08	3,900.43	3,614.20	-286.23	-7%
Severn Trent Water	7,347.69	7,240.93	-106.76	-0.01	1,430.97	1,313.12	-117.86	-0.08	8,778.67	8,554.05	-224.62	-3%
South West Water	1,964.07	2,000.96	36.89	0.02	343.97	325.23	-18.74	-0.05	2,308.04	2,326.19	18.15	1%
Southern Water	3,606.13	3,588.09	-18.03	-0.01	543.98	491.59	-52.39	-0.10	4,150.11	4,079.68	-70.43	-2%
Thames Water	12,860.19	10,978.71	-1,881.49	-0.15	1,604.59	1,596.04	-8.55	-0.01	14,464.78	12,574.75	-1,890.03	-13%
United Utilities	6,025.59	6,362.16	336.57	0.06	1,270.17	1,182.36	-87.81	-0.07	7,295.76	7,544.52	248.76	3%
Wessex Water	2,328.06	1,983.02	-345.05	-0.15	205.16	248.73	43.56	0.21	2,533.22	2,231.74	-301.48	-12%
Yorkshire Water	4,825.19	4,844.06	18.87	0.00	602.45	634.62	32.17	0.05	5,427.64	5,478.68	51.04	1%
Affinity Water	1,497.21	1,495.86	-1.35	0.00	189.84	204.55	14.71	0.08	1,687.05	1,700.41	13.36	1%
Bristol Water	493.28	510.43	17.14	0.03	82.18	75.49	-6.69	-0.08	575.47	585.92	10.45	2%
Portsmouth Water	219.34	230.56	11.22	0.05	32.90	37.37	4.46	0.14	252.24	267.93	15.68	6%
South East Water	1,123.78	1,043.20	-80.58	-0.07	247.51	238.41	-9.10	-0.04	1,371.29	1,281.60	-89.69	-7%
South Staffs Water	607.58	651.87	44.29	0.07	121.67	127.41	5.74	0.05	729.25	779.28	50.03	7%
SES Water	325.58	284.34	-41.24	-0.13	35.10	43.83	8.73	0.25	360.68	328.17	-32.51	-9%
Total	55,142.57	52,553.45	-2,589.13	-0.05	8,912.04	8,802.99	-109.05	-0.01	64,054.62	61,356.44	-2,698.18	-4%

²⁶⁶ Excludes pension deficit recovery payments and equity issuance costs.

Table 47: Base allowances versus requested – before frontier shift and real price effects – £million 22-23 prices²⁶⁷

Company	Wholesale water				Wastewater network plus				Bioresources				Retail (residential retail + non-household retail)				Total			
	Company proposal	Our view	Our view minus company proposal		Company proposal	Our view	Our view minus company proposal		Company proposal	Our view	Our view minus company proposal		Company proposal	Our view	Our view minus company proposal		Company proposal	Our view	Our view minus company proposal	
			£m	% of company proposal			£m	% of company proposal			£m	% of company proposal			£m	% of company proposal			£m	% of company proposal
Anglian Water	2,941	2,737	-204	-7%	2,563	2,407	-156	-6%	458	459	1	0%	503	517	15	3%	6,465	6,121	-344	-5%
Dŵr Cymru	1,720	1,756	35	2%	1,295	1,352	56	4%	206	230	23	11%	298	331	33	11%	3,519	3,667	148	4%
Hafren Dyfrdwy	181	171	-10	-6%	35	30	-5	-14%	3	3.7	1	21%	17	17	0	0%	236	221.0	-15	-6%
Northumbrian Water	2,302	2,143	-159	-7%	1,095	955	-139	-13%	172	181	9	5%	332	335	3	1%	3,900	3,614	-286	-7%
Severn Trent Water	4,167	3,965	-202	-5%	3,411	3,186	-226	-7%	531	651	120	23%	670	753	83	12%	8,779	8,554	-225	-3%
South West Water	1,070	1,130	60	6%	833	852	19	2%	224	165	-59	-26%	181	179	-2	-1%	2,308	2,326	18	1%
Southern Water	1,380	1,287	-92	-7%	2,108	2,146	38	2%	251	278	28	11%	412	368	-44	-11%	4,150	4,080	-70	-2%
Thames Water	6,771	6,301	-470	-7%	5,331	4,435	-896	-17%	1,250	778	-473	-38%	1,113	1,061	-52	-5%	14,465	12,575	-1,890	-13%
United Utilities	3,330	3,379	49	1%	2,805	2,980	175	6%	509	515	6	1%	652	671	19	3%	7,296	7,545	249	3%
Wessex Water	885	690	-195	-22%	1,155	1,146	-9	-1%	301	191	-110	-37%	192	206	13	7%	2,533	2,232	-301	-12%
Yorkshire Water	2,718	2,440	-279	-10%	1,912	2,181	269	14%	351	400	49	14%	446	458	12	3%	5,428	5,479	51	1%
Affinity Water	1,523	1,527	4	0%									164	173	9	6%	1,687	1,700	13	1%
Bristol Water	508	519	11	2%									67	67	-1	-1%	575	586	10	2%
Portsmouth Water	222	239	18	8%									31	29	-2	-7%	252	268	16	6%
South East Water	1,246	1,171	-75	-6%									125	110	-15	-12%	1,371	1,282	-90	-7%
South Staffs Water	662	702	40	6%									67	77	10	16%	729	779	50	7%
SES Water	322	289	-33	-10%									39	39	1	2%	361	328	-33	-9%
Total	31,947	30,446	-1,501	-4.7%	22,542	21,669	-873	-4%	4,256	3,850	-406	-10%	5,309	5,391	82	2%	64,055	61,356	-2,698	-4%

²⁶⁷ PR24 base expenditure allowances exclude pension deficit recovery payments and equity issuance costs.

Table 48: Water enhancement allowances – before frontier shift and real price effects – £million 22-23 prices

Company	WINEP / NEP	Supply-demand balance and metering	Resilience and security	Water quality improvements	Other enhancement areas	Total water enhancement allowance
Anglian Water	52.66	1,880.86	51.17	232.94	0.00	2,217.63
Dŵr Cymru	35.38	181.42	173.38	168.29	41.02	599.50
Hafren Dyfrdwy	2.57	3.73	15.84	4.34	0.00	26.48
Northumbrian Water	45.56	555.76	161.62	56.68	1.30	820.92
Severn Trent Water	368.56	1,154.87	297.19	485.07	2.87	2,308.56
South West Water	54.11	203.21	79.87	113.48	5.29	455.95
Southern Water	67.53	1,096.34	578.61	101.89	99.39	1,943.76
Thames Water	122.77	1,525.77	1,041.55	273.17	649.79	3,613.06
United Utilities	122.72	373.57	228.81	354.13	20.50	1,099.74
Wessex Water	38.21	133.38	24.19	53.22	0.34	249.35
Yorkshire Water	74.64	326.50	88.92	99.11	0.00	589.17
Affinity Water	157.30	250.74	31.55	252.45	0.00	692.03
Bristol Water	8.12	39.77	5.04	85.85	0.00	138.78
Portsmouth Water	4.20	63.82	18.60	39.95	84.99	211.57
South East Water	81.68	160.45	266.22	71.82	0.00	580.17
South Staffs Water	15.60	91.36	19.77	40.21	0.00	166.94
SES Water	4.29	25.67	4.60	12.07	0.00	46.63
Total	1,255.88	8,067.23	3,086.93	2,444.69	905.51	15,760.24

Table 49: Wastewater enhancement allowances – before frontier shift and real price effects – £million 22-23 prices

Company	WINEP / NEP			Resilience and security	Growth at sewage treatment works	Industrial Emissions Directive	Other enhancement areas	Total wastewater enhancement allowance
	Storm overflows	Nutrients	Other					
Anglian Water	787.81	1,048.03	477.06	29.59	280.17	104.45	147.42	2,874.52
Dŵr Cymru	1,108.00	184.41	381.56	15.43	87.22	14.30	71.41	1,862.32
Hafren Dyfrdwy	11.34	8.02	3.50	0.21	0.88	0.00	0.87	24.81
Northumbrian Water	1,074.87	387.12	286.72	37.01	38.19	0.00	15.18	1,839.08
Severn Trent Water	1,708.21	605.12	717.00	44.50	701.61	274.33	319.61	4,370.37
South West Water	764.33	150.18	147.97	0.00	21.34	38.99	23.50	1,146.31
Southern Water	1,059.72	626.97	394.98	48.09	306.14	137.65	100.93	2,674.49
Thames Water	783.81	1,237.38	375.62	100.84	182.54	299.67	1,706.30	4,686.16
United Utilities	2,497.39	539.22	1,367.75	75.11	99.58	238.26	125.68	4,942.99
Wessex Water	580.06	819.94	235.14	9.34	121.98	76.16	8.01	1,850.62
Yorkshire Water	1,564.75	360.39	341.67	15.46	24.65	81.44	68.45	2,456.80
Total	11,940.28	5,966.78	4,728.96	375.58	1,864.31	1,265.24	2,587.35	28,728.48

Table 50: Enhancement allowances versus requested – before frontier shift and real price effects – £million 22-23 prices

Company	Wholesale water				Wastewater network plus				Bioresources				Total			
	Company proposal	Our view	Our view minus company proposal		Company proposal	Our view	Our view minus company proposal		Company proposal	Our view	Our view minus company proposal		Company proposal	Our view	Our view minus company proposal	
			£m	% of company proposal			£m	% of company proposal			£m	% of company proposal			£m	% of company proposal
Anglian Water	2,185	2,218	33	2%	2,630	2,704	75	2.8%	188	170	-17	-9%	5,002	5,092	90	2%
Dŵr Cymru	709	599	-109	-15%	1,742	1,770	28	1.6%	118	92	-25	-21%	2,568	2,462	-107	-4%
Hafren Dyfrdwy	29	26	-3	-10%	24	25	1	4.0%	0	0	0	0%	53	51	-2.0	-4%
Northumbrian Water	841	821	-20	-2%	1,900	1,784	-116	-6.1%	59	55	-4	-7%	2,801	2,660	-141	-5%
Severn Trent Water	2,362	2,309	-53	-2%	4,354	3,859	-495	-11.4%	492	511	19	4%	7,207	6,679	-528	-7%
South West Water	560	456	-104	-19%	1,113	1,075	-38	-3.5%	83	72	-11	-14%	1,756	1,602	-153	-9%
Southern Water	2,311	1,944	-367	-16%	2,689	2,486	-203	-7.6%	222	189	-33	-15%	5,222	4,618	-604	-12%
Thames Water	3,726	3,613	-113	-3%	6,021	4,386	-1,634	-27.1%	534	300	-235	-44%	10,282	8,299	-1,982	-19%
United Utilities	1,214	1,100	-114	-9%	5,354	4,595	-759	-14.2%	343	348	5	2%	6,911	6,043	-868	-13%
Wessex Water	288	249	-38	-13%	2,179	1,731	-448	-20.6%	161	120	-42	-26%	2,628	2,100	-528	-20%
Yorkshire Water	516	589	73	14%	2,445	2,332	-113	-4.6%	116	125	9	7%	3,078	3,046	-32	-1%
Affinity Water	715	692	-23	-3%									715	692	-23	-3%
Bristol Water	192	139	-54	-28%									192	139	-54	-28%
Portsmouth Water	217	212	-6	-3%									217	212	-6	-3%
South East Water	770	580	-190	-25%									770	580	-190	-25%
South Staffs Water	152	167	15	10%									152	167	15	10%
SES Water	59	47	-13	-21%									59	47	-13	-21%
Total	16,846	15,760	-1,086	-6%	30,452	26,747	-3,704	-12.2%	2,316	1,981	-335	-14%	49,613	44,489	-5,125	-10%

Table 51: Total allowances versus requested – before frontier shift and real price effects – £million 22-23 prices

Company	Wholesale water				Wastewater network plus				Bioresources				Retail (residential retail + non-household retail)				Total			
	Company proposal	Our view	Our view minus company proposal		Company proposal	Our view	Our view minus company proposal		Company proposal	Our view	Our view minus company proposal		Company proposal	Our view	Our view minus company proposal		Company proposal	Our view	Our view minus company proposal	
			£m	% of company proposal			£m	% of company proposal			£m	% of company proposal			£m	% of company proposal			£m	% of company proposal
Anglian Water	5,126	4,955	-171	-3%	5,193	5,111	-81	-2%	646	629	-16	-3%	503	517	15	3%	11,467	11,213	-254	-2%
Dŵr Cymru	2,429	2,355	-74	-3%	3,037	3,122	84	3%	324	322	-2	-1%	298	331	33	11%	6,088	6,129	41	1%
Hafren Dyfrdwy	210	197	-13	-6%	59	55	-4	-7%	3	4	1	21%	17	17	0	0%	289	272	-17	-6%
Northumbrian Water	3,143	2,964	-179	-6%	2,995	2,739	-256	-9%	231	236	4	2%	332	335	3	1%	6,701	6,274	-427	-6%
Severn Trent Water	6,528	6,273	-255	-4%	7,765	7,045	-720	-9%	1,023	1,162	139	14%	670	753	83	12%	15,986	15,233	-753	-5%
South West Water	1,629	1,586	-43	-3%	1,946	1,927	-20	-1%	307	237	-70	-23%	181	179	-2	-1%	4,064	3,928	-135	-3%
Southern Water	3,691	3,231	-459	-12%	4,797	4,632	-165	-3%	473	467	-6	-1%	412	368	-44	-11%	9,373	8,698	-675	-7%
Thames Water	10,497	9,914	-584	-6%	11,352	8,822	-2,530	-22%	1,784	1,077	-707	-40%	1,113	1,061	-52	-5%	24,746	20,874	-3,872	-16%
United Utilities	4,544	4,479	-65	-1%	8,159	7,575	-585	-7%	851	863	11	1%	652	671	19	3%	14,206	13,587	-619	-4%
Wessex Water	1,173	939	-234	-20%	3,334	2,877	-457	-14%	463	310	-152	-33%	192	206	13	7%	5,161	4,332	-830	-16%
Yorkshire Water	3,235	3,029	-206	-6%	4,357	4,513	156	4%	467	525	58	12%	446	458	12	3%	8,506	8,525	19	0%
Affinity Water	2,238	2,219	-18	-1%									164	173	9	6%	2,402	2,392	-9	0%
Bristol Water	700	658	-42	-6%									67	67	-1	-1%	768	725	-43	-6%
Portsmouth Water	439	451	12	3%									31	29	-2	-7%	469	479	10	2%
South East Water	2,016	1,752	-265	-13%									125	110	-15	-12%	2,141	1,862	-280	-13%
South Staffs Water	814	869	55	7%									67	77	10	16%	881	946	65	7%
SES Water	381	335	-46	-12%									39	39	1	2%	420	375	-45	-11%
Total	48,793	46,206	-2,587	-5%	52,994	48,416	-4,578	-9%	6,572	5,831	-741	-11%	5,309	5,391	82	2%	113,668	105,845	-7,823	-7%

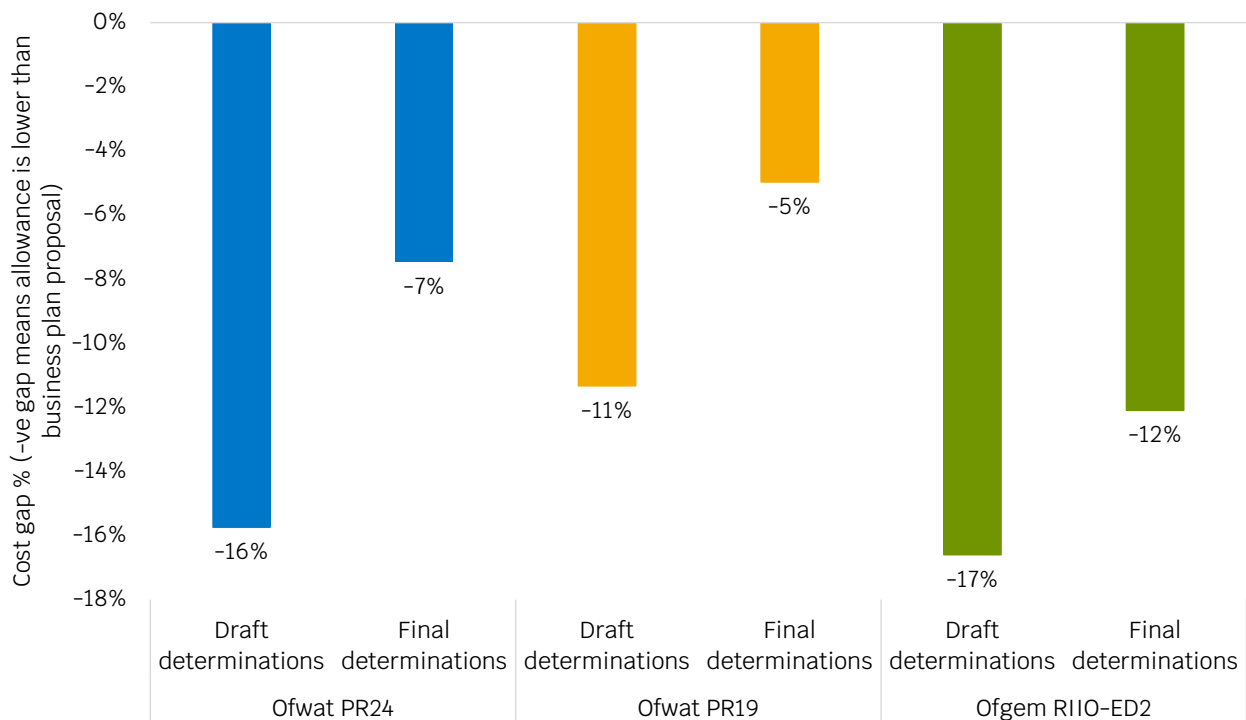
5.2 Expenditure allowances after the application of frontier shift efficiency and real price effects

This section summarises the outcome of our cost assessment after applying the catch-up efficiency, frontier shift efficiency and real price effects adjustments. Our frontier shift efficiency and real price effect assumptions are set out in section 4.

In summary:

- **Totex allowances (base + enhancement)** – we allow £103.7 billion of expenditure, including contingent allowances. This is 7 percent below companies' requested expenditure in draft determination representations of £112.0 billion, and 18% higher than our draft determination totex allowances.
- **Base expenditure allowances** – we allow £60.1 billion. This is 5 percent below companies' requested base expenditure in draft determination representations of £63.1 billion, and 10% higher than our draft determination base expenditure allowances. Base expenditure allowance are also 19% higher than our base expenditure allowances in PR19 final determinations (£50.5 billion), and 7% more than what companies have spent in the past 5 years (£56.4 billion).
- **Enhancement expenditure allowances** – we allow £43.6 billion. This is 11 percent below companies' requested enhancement expenditure of £49.0 billion, but 30% higher than our draft determination enhancement expenditure allowances. Enhancement expenditure allowances are around three times the level in PR19.

The figure below compares the cost challenge (ie percentage gap between efficient expenditure allowances and company business plan proposal) between our PR24 draft and final determinations, PR19 draft and final determinations, and Ofgem's most recent electricity distribution price control (RIIO-ED2). Our final determinations totex allowance after frontier shift efficiency and real price effects is 7 percent less than company proposals. This is smaller than the cost challenge applied by Ofgem at RIIO-ED2 draft determinations (-12%) and slightly larger than the cost challenge at PR19 final determinations (-5%).

Figure 20: comparison of cost challenges at recent price reviews

5.2.1 Changes in allowances since draft determination

Base expenditure

The higher base cost allowances between PR24 draft and final determinations reflect increased:

- energy cost allowances reflecting future energy price growth;
- business rates allowances reflecting the likely impact of expected 2026 and 2029 revaluation of water business rates allowances; and
- network reinforcement costs to facilitate economic growth and ambitious housing growth targets.

The higher base cost allowances between PR19 and PR24 final determinations reflect:

- forecast growth in the underlying cost drivers (such as scale and treatment complexity);
- higher costs in recent years caused by increases in input price pressures above general inflation;

- increased requirements on companies (for example more stringent phosphorus permit levels when treating sewage); and
- additional allowances for water companies to increase mains renewals, meter renewals, network reinforcement, and to make progress to deliver net zero.

We expect companies to deliver a good level of service from their base expenditure allowances and we have calibrated our proposed service levels so that they are consistent with our base expenditure allowances. The lower base allowances in final determinations compared to representations reflects our expectation that companies deliver services more efficiently than companies forecast. Where companies receive higher base expenditure allowances than requested, this is largely the result of higher energy and business rate forecasts. We will correct for differences between forecast and outturn energy costs in the PR24 end-of-period reconciliation. Business rates also has enhanced 10:10 cost sharing rates, which means that 90% of any underspend will be returned to customers and 90% of any overspend will be borne by customers.

Enhancement expenditure

Our enhancement expenditure allowances at final determinations are £44 billion. This is £10 billion higher than at PR24 draft determinations, £5 billion lower than what companies requested in their representations, and is more than three times higher than the PR19 final determinations.

Nearly 90% of enhancement expenditure is driven by the requirements specified by the water resources management plans (WRMPs), the environmental programmes of the Environment Agency and Natural Resources Wales, Drinking Water Inspectorate and other statutory drivers such as the Industrial Emissions Directive. The increase in expenditure compared to PR19 reflects:

- the need to meet statutory environmental requirements such as those set out in the Water Framework Directive;
- the need to make progress towards the Environment Act target on phosphorus removal and the storm discharge reduction plan targets on storm overflows; and
- the need to improve the water supply and water demand balance (aligned to WRMPs) and to reduce water abstraction.

The higher enhancement allowances between PR24 draft and final determinations reflect:

- strategic water resource option costs that reflect an increase in the scope of requests, managed through the regulator's alliance for progressing infrastructure development (RAPID);

- increased raw water deterioration costs driven in part by new DWI requirements on PFAS;
- increased water supply and demand expenditure reflecting increased requests and additional company evidence;
- increased storm overflow requests reflecting the addition of new storm overflows for improvement, scope increases, increased allowances for green solutions and a better reflection of scheme specific factors;
- increased microbiological treatment costs from new bathing water requirements;
- increased expenditure to meet the Industrial Emissions Directive; and
- increased expenditure to accommodate growth at sewage treatment works to reflect requests to accommodate additional growth.

5.2.2 Total expenditure challenges across companies

We challenge the expenditure proposals of five companies by more than 5%:

- Wessex Water (17% totex gap): the company reduced its expenditure request compared to its business plan. But it still has a 14% base cost gap, and 20% enhancement cost gap. Its base expenditure cost challenge is the result of a poorly evidenced capital maintenance cost adjustment claim (see section 2.4 for more details). Its higher enhancement costs are largely related to phosphorus removal, where despite reducing its request, it is still requesting far higher costs than other companies.
- Thames Water (16% totex gap): the company increased its base and elements of its enhancement expenditure request by £2.5 billion (11%) since its business plan. Our challenge reflects our rejection of its requests for customer funding to allow compliance with existing permits and to complete the delivery of its PR19 WINEP programme and Thames Water's high costs across a range of benchmarked cost areas.
- SES Water (14% totex gap): the company has a gap on base (largely the result of our assessment of network topography and water softening cost adjustment claims) and enhancement (related to metering and leakage).
- South East Water (13% totex gap): the company continues to request high enhancement allowances across a range of areas, with insufficient supporting evidence.
- Southern Water (11% totex gap): the company increased its expenditure request by £1.7 billion (22%) since its business plan. A large part of the challenge on enhancement expenditure relates to strategic water resource options where the company materially

increased its request compared to its business plan, and we are rejecting upfront funding for risks which are covered through separate mechanisms.

We explain our efficient base and enhancement allowances for each company and compare these against companies PR24 August 2024 draft determination representations.

Anglian Water

Our efficient base expenditure allowance in Anglian Water's final determination totals £6 billion. This is 17 percent higher than the company's PR19 base expenditure allowance and 10 percent higher than our proposed base expenditure allowance at PR24 draft determinations. But it is 5 percent (£286 million) less than what the company requested in its draft determination representations. This is explained by our assessment of cost adjustment claims: mains replacement (partially accepted); leakage (rejected); boundary box replacement (rejected); and wastewater network reinforcement and reduce risk of sewer flooding (partially accepted). Our cost adjustment claim assessment can be found in the published Anglian Water cost adjustment claim excel file.

Our efficient enhancement expenditure allowance in Anglian Water's final determination is £5.0 billion. This is 2% more than it requested as the company's proposals are more efficient than our cost benchmarks.

Dŵr Cymru

Our efficient base expenditure allowance in Dŵr Cymru's final determination totals £3.6 billion. This is 14 percent higher than the company's PR19 base expenditure allowance and 10 percent higher than our proposed base expenditure allowance at PR24 draft determinations. It is also 4 percent (£151 million) more than what the company requested in its draft determination representations. This is explained the company forecasting lower energy costs and business than are included in its base expenditure allowance. We will adjust energy and business rates allowances at the end of the price control period to reflect actual prices.

Our efficient enhancement expenditure allowance in Dŵr Cymru's final determination is £2.4 billion. This is 7% less than it requested. The largest differences between our enhancement expenditure allowance and the company's proposals are:

- Water – Resilience and security (£88 million cost challenge) – a significant part of the company's request is to resolve burst rates from asbestos cement main failures. The company should deliver this through base expenditure allowances.
- Wastewater – Other enhancement areas (£67 million cost challenge) – the main freeform cost challenge related to a request to replace high-risk rising mains and large sewers for pollution reduction, which is an activity the company should deliver with base allowances.

- Water – Water quality improvements (£17 million cost challenge) – the company has historically carried out insufficient water mains renewals with base expenditure allowance. We therefore applied a base overlap challenge. We also applied a cost efficiency challenge as the company did not provide sufficient and convincing evidence that its proposed costs are efficient.

Hafren Dyfrdwy

Our efficient base expenditure allowance in Hafren Dyfrdwy's final determination totals £216 million. This is 18 percent higher than the company's PR19 base expenditure allowance and 8 percent higher than our proposed base expenditure allowance at PR24 draft determinations. It is only 1 percent (£1 million) less than what the company requested in its draft determination representations, which is explained by our decision to partially accept the company's cost adjustment claims related to managing interruptions performance and reservoir maintenance.

Our efficient enhancement expenditure allowance in Hafren Dyfrdwy's final determination is £50 million. This is 3% less than the company requested. The most material cost challenge is for 'Water – Resilience and security' (£1.5 million challenge), where we applied a 10% cost efficiency challenge to the company's proposed reservoir safety enhancement costs due to limited cost benchmarking evidence.

Northumbrian Water

Our efficient base expenditure allowance in Northumbrian Water's final determination totals £3.5 billion. This is 11 percent higher than the company's PR19 base expenditure allowance and 6 percent higher than our proposed base expenditure allowance at PR24 draft determinations. But 5 percent (£179 million) less than what the company requested in its draft determination representations, which is explained by our assessment of the company's capital maintenance cost adjustment claims: mains replacement (partially accept); water capital maintenance at treatment works and service reservoirs (rejected); and wastewater capital maintenance at treatment works. Our assessment can be found in the company's published cost adjustment claim excel model.

Our efficient enhancement expenditure allowance in Northumbrian Water's final determination is £2.6 billion. This is 1% less than the company requested. The largest differences between our enhancement allowance and the company's proposals are:

- Wastewater – Resilience and security (£53 million cost challenge) – the company has requested power and flood resilience funding significantly above the climate resilience allowance, which it has not justified.
- Water – Resilience and security (£28 million cost challenge) – the company requests investment at water treatment works to make them resilient to hot weather, which we

have challenged because of overlap with base expenditure allowances for asset replacement.

Severn Trent Water

Our efficiency base expenditure allowance in Severn Trent Water's final determination totals £8.4 billion. This is 19 percent higher than the company's PR19 base expenditure allowance and 17 percent higher than our proposed base expenditure allowance at PR24 draft determinations. But it is 2 percent (£175 million) less than what the company requested in its draft determination representations. This is mostly explained by our decision to partially accept the company's cost adjustment claim for network reinforcement and bioresources growth. Our assessment can be found in the published company cost adjustment claim excel file.

Our efficient enhancement expenditure allowance in Severn Trent Water's final determination is £6.5 billion. This is 8% less than the company requested. The largest differences between our enhancement allowance and the company's proposals are:

- Wastewater – Growth at sewage treatment works (£228 million cost challenge) – the company's proposed costs are less efficient than our cost benchmark. We also made a non-compliance cost adjustment to ensure that customers do not pay towards the cost of addressing non-compliance issues at sewage treatment works, which the company proposed in its draft determination representations.
- Wastewater – Nutrients (£204 million cost challenge) – the company's proposed phosphorus removal enhancement costs are less efficient than our cost benchmark.
- Wastewater – Other enhancement areas (£86 million cost challenge) – largely driven by net zero enhancement, where we do not provide allowance for schemes that the company should deliver with base expenditure allowances or other enhancement allowances (for example, WINEP or Industrial Emissions Directive).

South West Water – South West Area

Our efficient base expenditure allowance in South West Water's – South West Area final determination totals £2.3 billion. This is 14 percent higher than the company's PR19 base expenditure allowance and 9 percent higher than our proposed base expenditure allowance at PR24 draft determinations. It is also 2 percent (£42 million) more than what the company requested in its draft determination representations. This is mainly because the company forecasted lower energy costs and business rates than is reflected in its allowance. We will adjust allowance at the end of the price control period based on actual prices.

Our efficient enhancement expenditure allowance in South West Water's – South West Area final determination is £1.6 billion. This is 8% less than the company requested. The largest differences between our enhancement allowance and the company's proposals are:

- Water – Supply-demand balance and metering (£53 million cost challenge) – due to the company proposing high leakage reduction unit costs compared to our cost benchmark; and a very high unit cost supply option to upgrade a treatment works that includes significant overlap with activities that should be delivered with base allowances.
- Water – Water quality improvements (£41 million cost challenge) – the company should be delivering more mains renewals with base expenditure allowances.
- Wastewater – Growth at sewage treatment works (£13 million cost challenge) – we applied a cost challenge due to under-delivery in previous price control periods.

Southern Water

Our efficient base expenditure allowance in Southern Water's final determination totals £4.0 billion. This is 23 percent higher than the company's PR19 base expenditure allowance and 9 percent higher than our proposed base expenditure allowance at PR24 draft determinations. But 8 percent (£328 million) less than what the company requested in its draft determination representations, which is explained by:

- The company requesting higher energy and business rate costs than we have allowed. Allowances will be adjusted in the PR24 end-of-period reconciliation to reflect actual prices faced by companies.
- Our decision not to allow the company's base cost adjustment claims related to regional labour costs, advanced anaerobic digestion, coastal and capital maintenance.
- The company requesting increases in base expenditure that was not justified. For example, requested residential retail expenditure increased by 16 percent.

Our efficient enhancement expenditure allowance in Southern Water's final determination is £4.5 billion. This is 14% less than the company requested. The largest differences between our enhancement allowance and the company's proposals are:

- Water – Supply-demand balance and metering (£313 million cost challenge) – we have not allowed the requested funding which covers the risk pot for Havant Thicket and CAP management costs as this is dealt with through separate mechanisms. The company also proposed leakage reduction unit costs that are much higher than our cost benchmark and requested funding for leakage mains renewals that the company should deliver with base expenditure allowances. The company's supply schemes in its water resources management plan are also inefficient compared to our cost benchmarks.

- Wastewater – Storm overflows (£124 million cost challenge) – the company's proposed costs are inefficient compared to our cost benchmarks.
- Wastewater – Growth at sewage treatment works (£42 million cost challenge) – we have disallowed costs for two schemes due to no population growth forecast over the 2025-30 period, and also applied a cost adjustment to prevent customers paying twice for capacity increases at sewage treatment works.

Thames Water

Our efficient base expenditure allowance in Thames Water's final determination totals £12.3 billion. This is 22 percent higher than the company's PR19 base expenditure allowance and 9 percent higher than our proposed base expenditure allowance at PR24 draft determinations. But 14 percent (£2 billion) less than what the company requested in its draft determination representations, which is explained by:

- the company requested a significant increase in capital maintenance spend, which was poorly evidenced;
- our assessment of the company's cost adjustment claims – mains replacement (partially accepted); network reinforcement (partially accepted); and the impact of population transience on bad debt (rejected); and
- the company used alternative benchmarking models to support its business plan proposals, which do not have a strong engineering rationale.

Our efficient enhancement expenditure allowance in Thames Water's final determination is £8.2 billion. This is 20% less than the company requested. The largest differences between our enhancement allowance and the company's proposals are:

- Wastewater – Other enhancement areas (£983 million cost challenge) – the company proposal is to address compliance issues at sewage treatment works and the additional costs of delivering the PR19 WINEP programme, which customers should not provide additional funding.
- Wastewater – Nutrients (£300 million cost challenge) – the company's proposed costs are inefficient compared to our cost benchmarks.
- Wastewater – Industrial Emissions Directive (£235 million cost challenge) – the company's proposed costs are inefficient compared to our cost benchmarks, and we have concerns with overlap with activities that should be delivered with base expenditure allowances (for example, capital maintenance).

United Utilities

Our efficient base expenditure allowance in United Utilities' final determination totals £7.4 billion. This is 19 percent higher than the company's PR19 base expenditure allowance and 8 percent higher than our proposed base expenditure allowance at PR24 draft determinations. It is also 2 percent (£179 million) more than what the company requested in its draft determination representations. This is largely explained by the company becoming more efficient on wastewater network plus base costs in recent years. Setting a base expenditure allowance that is more than requested incentivises the company to deliver efficiencies going forward and put forward efficient cost proposals at future price reviews. This allows us to challenge all water companies' estimates and secure better value for customers across England and Wales.

Our efficient enhancement expenditure allowance in United Utilities' final determination is £5.9 billion. This is 13% less than the company requested. The largest differences between our enhancement allowance and the company's proposals are:

- Wastewater – Storm overflows (£528 million cost challenge) – the company's proposed costs are inefficient compared to our cost benchmarks, even after reflecting scheme specific factors.
- Wastewater – Nutrients (£143 million cost challenge) – phosphorus removal enhancement is the main contributing factor, where the company's proposed costs are inefficient compared to our cost benchmarks.
- Water – Supply-demand balance and metering (£82 million cost challenge) – largely caused by the company proposing leakage mains renewals, which the company should deliver with its base expenditure allowance.

Wessex Water

Our efficient base expenditure allowance in Wessex Water's final determination totals £2.2 billion. This is 10 percent higher than the company's PR19 base expenditure allowance and 9 percent higher than our proposed base expenditure allowance at PR24 draft determinations. But 14 percent (£346 million) less than what the company requested in its draft determination representations, which is explained by our decision to reject the company's capital maintenance cost adjustment claim at final determination. Our assessment can be found in the company's published cost adjustment claim excel model.

Our efficient enhancement expenditure allowance in Wessex Water's final determination is £2.0 billion. This is 20% less than the company requested. The largest differences between our enhancement allowance and the company's proposals are:

- Wastewater – Nutrients (£315 million cost challenge) – the company's proposed phosphorus removal enhancement schemes are generally inefficient compared to our cost benchmarks.

- Wastewater – Growth at sewage treatment works (£54 million cost challenge) – the company's proposed schemes are generally inefficient compared to our cost benchmarks. We also applied a cost adjustment to prevent customers paying twice for capacity at sewage treatment works that the company should have delivered in previous price control periods.
- Wastewater – Industrial Emissions Directive (£41 million cost challenge) – the company's proposed schemes are generally inefficient compared to our cost benchmarks.

Yorkshire Water

Our efficient base expenditure allowance in Yorkshire Water's final determination totals £5.4 billion. This is 26 percent higher than the company's PR19 base expenditure allowance and 10 percent higher than our proposed base expenditure allowance at PR24 draft determinations. It is also 1 percent (£32 million) more than what the company requested in its draft determination representations, which is explained by the network reinforcement cost adjustment we have allowed to facilitate population growth and new housing. Any underspend against the network reinforcement allowance will be returned to customers at the end of the price control period.

Our efficient enhancement expenditure allowance in Yorkshire Water's final determination is £3.0 billion. This is 1% less than the company requested. The largest contributor is the £85 million cost challenge on storm overflows.

Affinity Water

Our efficient base expenditure allowance in Affinity Water's final determination totals £1.7 billion. This is 16 percent higher than the company's PR19 base expenditure allowance and 11 percent higher than our proposed base expenditure allowance at PR24 draft determinations. But only 1 percent (£23 million) less than what the company requested in its draft determination representations. This is explained by our decision to reject cost adjustment claims related to regional wages and transience, which are already accounted for within our base allowance and/or are immaterial.

Our efficient enhancement expenditure allowance in Affinity Water's final determination is £679 million. This is 6% less than the company requested. The largest differences between our enhancement allowance and the company's proposals is on supply-demand balance and metering (£16 million cost challenge) due to the company's proposed costs being more expensive than our cost benchmarks.

South West Water – Bristol Area

Our efficient base expenditure allowance in South West Water's – Bristol Area final determination totals £573 million. This is 15 percent higher than the company's PR19 base

expenditure allowance and 8 percent higher than our proposed base expenditure allowance at PR24 draft determinations. It is also 3 percent (£14 million) more than what the company requested in its draft determination representations. This is driven by differences in energy and business rates cost forecasts, and the company adjusting its requested base expenditure to be more in line with its allowance at draft determination. We will adjust allowances to reflect actual energy prices and business rates faced by companies at the end of the price control period.

Our efficient enhancement expenditure allowance in South West Water's – Bristol Area final determination is £135 million. This is 27% less than the company requested. The cost challenge is explained by the following two areas:

- Water – Water quality improvements (£33 million cost challenge) – the company has proposed mains renewals to address water quality issues. The company should deliver these mains renewals with base expenditure allowances.
- Water – Supply-demand balance and metering (£19 million cost challenge) – the company's proposed leakage reduction and water resource supply options unit costs are higher than our cost benchmarks.

Portsmouth Water

Our efficient base expenditure allowance in Portsmouth Water's final determination totals £262 million. This is 12 percent higher than the company's PR19 base expenditure allowance and 7 percent higher than our proposed base expenditure allowance at PR24 draft determinations. It is also 7 percent higher than what the company requested in its draft determination representations. This is mainly because its forecasts for energy costs and business rates were lower than ours. We will adjust allowances for these items at the end of the 2025–30 period to reflect actual changes in prices. The company is also among the most efficient water companies, and put forward efficient cost proposals compared to other companies. Setting a base expenditure allowance that is more than requested incentivises the company to deliver efficiencies going forward and put forward efficient cost proposals at future price reviews. This allows us to challenge all water companies' estimates and secure better value for customers across England and Wales.

Our efficient enhancement expenditure allowance in Portsmouth Water's final determination is £209 million. This is 2% less than the company requested, with relatively minor cost challenges across multiple water enhancement areas.

South East Water

Our efficient base expenditure allowance in South East Water's final determination totals £1.3 billion. This is 28 percent higher than the company's PR19 base expenditure allowance and 13 percent higher than our proposed base expenditure allowance at PR24 draft determinations.

But 7 percent (£88 million) less than what the company requested in its draft determination representations, which is explained by:

- The cost efficiency challenges we have applied to the company's network reinforcement and economies of scale at water treatment works cost adjustment claims. More details can be found in the published company cost adjustment claim excel file.
- The company forecasting higher business rates than are reflected in its base expenditure allowance. Allowances will be adjusted at the end of the price control period based on actual business rates using enhanced 10:10 cost sharing rates. This means that the company can recover 90 percent of any overspend on business rates from customers. Conversely, 90 percent of any underspend will be returned to customers.
- We assume the base cost models fund companies to deliver a water mains renewal rate of 0.3 percent per year, which is higher than what the South East Water assumed in its business plan (0.2 percent per year).

Our efficient enhancement expenditure allowance in South East Water's final determination is £566 million. This is 26% less than the company requested. The largest differences between our enhancement allowance and the company's proposals are:

- Supply-demand balance and metering (£75 million cost challenge) – the company proposed a substantial amount of leakage enhancement mains renewals, which the company should deliver with base expenditure allowances. The company's proposed water demand enhancement unit costs are also higher than our cost benchmarks.
- Resilience and security (£70 million cost challenge) – we have challenged the need for investment for the company's proposed resilience programme because the risks of customers paying twice due to the overlap with PR19 funded schemes and the expectations of base expenditure.

South Staffs Water

Our efficient base expenditure allowance in South Staffs Water's final determination totals £763 million. This is 18 percent higher than the company's PR19 base expenditure allowance and 6 percent higher than our proposed base expenditure allowance at PR24 draft determinations. It is also 4 percent (£32 million) more than what the company requested in its draft determination representations. This is mainly because its forecasts for energy costs and business rates were lower than ours. We will adjust allowances for these items at the end of the 2025–30 period to reflect actual changes in prices. The company is also among the most efficient water companies, and put forward efficient cost proposals compared to other companies.

Our efficient enhancement expenditure allowance in South Staffs Water's final determination is £163 million. This is 8% more than the company requested. The company's proposed costs are efficient compared to our cost benchmarks.

Setting an expenditure allowance that is more than requested incentivises the company to deliver efficiencies going forward and put forward efficient cost proposals at future price reviews. This allows us to challenge all water companies' estimates and secure better value for customers across England and Wales.

SES Water

Our efficient base expenditure allowance in SES Water's final determination totals £321 million. This is 28 percent higher than the company's PR19 base expenditure allowance and 6 percent higher than our proposed base expenditure allowance at PR24 draft determinations. But 13 percent (£49 million) less than what the company requested in its draft determination representations, which is explained by:

- Rejection of the company's water pumping requirements cost adjustment claims, and partial acceptance of the company's water softening cost adjustment claim. Our assessment can be found in the company's published cost adjustment claim excel file.
- SES Water forecast higher energy costs than are reflected in its base expenditure allowance. We will adjust the company's energy cost allowance based on actual energy prices at the end of the price control period.
- SES Water retracted cost adjustment claims relating to regional wages and economies of scale in retail in its draft determination representations, but did not amend its base expenditure proposal for the 2025–30 period.

Our efficient enhancement expenditure allowance in SES Water's final determination is £46 million. This is 21% less than the company requested. Most of the enhancement cost challenge is on supply-demand balance and metering, which is caused by the company proposing inefficient leakage and smart meter unit costs compared to our cost benchmarks.

Table 52: Base allowances versus PR19 and actual expenditure – £million 22-23 prices²⁶⁸

Company	a) PR19 base allowance (£m 22-23)	b) Actual company base spend 19-20 to 23-24 (£m 22-23)	c) PR24 base allowance 25-26 to 29-30, post-frontier shift and real price effects (£m 22-23)	PR24 base allowance vs. PR19 allowance (c) – (a)		PR24 base allowance vs. actual spend 19-20 to 23-24 (c) – (b)	
				£m 22-23	%	£m 22-23	%
Anglian Water	5,141	5,387	5,996	854	17%	608	11%
Dŵr Cymru	3,136	3,540	3,590	454	14%	50	1%
Hafren Dyfrdwy	183	202	216	33	18%	15	7%
Northumbrian Water	3,180	3,466	3,542	362	11%	76	2%
Severn Trent Water	7,056	7,451	8,376	1,319	19%	925	12%
South West Water	1,993	2,291	2,277	284	14%	-14	-1%
Southern Water	3,239	4,510	3,991	753	23%	-519	-12%
Thames Water	10,097	11,383	12,301	2,204	22%	918	8%
United Utilities	6,194	6,823	7,387	1,194	19%	564	8%
Wessex Water	1,977	2,145	2,183	206	10%	38	2%
Yorkshire Water	4,256	4,896	5,359	1,103	26%	463	9%
Affinity Water	1,438	1,465	1,662	225	16%	198	13%
Bristol Water	497	559	573	76	15%	15	3%
Portsmouth Water	235	212	262	27	12%	50	24%
South East Water	978	1,104	1,255	276	28%	151	14%
South Staffs Water	645	592	763	118	18%	171	29%
SES Water	252	331	321	69	28%	-10	-3%
Total	50,497	56,355	60,055	9,557.5	19%	3,699	7%

²⁶⁸ PR24 base expenditure allowances exclude pension deficit recovery payments and equity issuance costs.

Table 53: Base allowances versus requested – after frontier shift and real price effects – £million 22-23 prices

Company	Wholesale water				Wastewater network plus				Bioresources				Retail (residential retail + non-household retail)				Total			
	Company proposal ²⁶⁹	Our view	Our view minus company proposal		Company proposal	Our view	Our view minus company proposal		Company proposal	Our view	Our view minus company proposal		Company proposal	Our view	Our view minus company proposal		Company proposal	Our view	Our view minus company proposal	
			£m	% of company proposal			£m	% of company proposal			£m	% of company proposal			£m	% of company proposal			£m	% of company proposal
Anglian Water	2,845	2,686	-160	-6%	2,480	2,359	-122	-5%	442	450	8	2%	514	501	-13	-2%	6,282	5,996	-286	-5%
Dŵr Cymru	1,678	1,722	44	3%	1,256	1,323	67	5%	207	225	18	9%	298	320	22	7%	3,439	3,590	151	4%
Hafren Dyfrdwy	162	167	5	3%	36	29	-6	-18%	3	4	1	25%	17	17	0	-2%	218	216	-1	-1%
Northumbrian Water	2,205	2,105	-101	-5%	1,038	935	-103	-10%	163	177	14	9%	314	325	11	3%	3,721	3,542	-179	-5%
Severn Trent Water	3,940	3,889	-51	-1%	3,192	3,121	-71	-2%	705	638	-67	-10%	714	729	14	2%	8,551	8,376	-175	-2%
South West Water	1,037	1,107	70	7%	807	835	27	3%	217	162	-55	-25%	174	173	-1	0%	2,235	2,277	42	2%
Southern Water	1,433	1,262	-171	-12%	2,216	2,100	-116	-5%	243	272	29	12%	426	356	-69	-16%	4,319	3,991	-328	-8%
Thames Water	6,693	6,170	-523	-8%	5,268	4,341	-927	-18%	1,232	763	-469	-38%	1,099	1,028	-71	-6%	14,292	12,301	-1,990	-14%
United Utilities	3,290	3,314	24	1%	2,771	2,919	148	5%	503	505	2	0%	645	650	5	1%	7,208	7,387	179	2%
Wessex Water	886	676	-210	-24%	1,151	1,122	-29	-3%	303	187	-116	-38%	190	199	9	5%	2,530	2,183	-346	-14%
Yorkshire Water	2,667	2,389	-278	-10%	1,879	2,135	256	14%	341	392	51	15%	441	444	3	1%	5,327	5,359	32	1%
Affinity Water	1,525	1,495	-30	-2%									160	167	8	5%	1,685	1,662	-23	-1%
Bristol Water	494	509	15	3%									65	65	0	0%	559	573	14	3%
Portsmouth Water	217	234	17	8%									27	28	0	1%	244	262	18	7%
South East Water	1,218	1,148	-70	-6%									125	107	-18	-14%	1,343	1,255	-88	-7%
South Staffs Water	664	688	24	4%									67	75	8	12%	731	763	32	4%
SES Water	333	283	-50	-15%									37	38	1	2%	370	321	-49	-13%
Total	31,288	29,842	-1,446	-4.6%	22,095	21,218	-877	-4%	4,358	3,774	-583	-13%	5,313	5,221	-92	-2%	63,053	60,055	-2,998	-5%

²⁶⁹ Company proposal reflects company view of costs in response to draft determinations.

Table 54: Enhancement allowances versus requested – after frontier shift and real price effects – £million 22-23 prices

Company	Wholesale water				Wastewater network plus				Bioresources				Total			
	Company proposal	Our view	Our view minus company proposal		Company proposal	Our view	Our view minus company proposal		Company proposal	Our view	Our view minus company proposal		Company proposal	Our view	Our view minus company proposal	
			£m	% of company proposal			£m	% of company proposal			£m	% of company proposal			£m	% of company proposal
Anglian Water	2,185	2,165	-19	-1%	2,533	2,644	111	4.4%	180	166	-14	-8%	4,898	4,975	77	2%
Dŵr Cymru	709	586	-123	-17%	1,759	1,731	-28	-1.6%	115	90	-25	-21%	2,583	2,407	-176	-7%
Hafren Dyfrdwy	29	26	-3	-9%	23	24	1	5.0%	0	0	0	0%	52	50	-1.6	-3%
Northumbrian Water	795	805	10	1%	1,793	1,752	-40	-2.2%	56	54	-2	-4%	2,644	2,611	-32	-1%
Severn Trent Water	2,340	2,260	-80	-3%	4,307	3,781	-526	-12.2%	491	500	9	2%	7,138	6,541	-597	-8%
South West Water	543	446	-97	-18%	1,082	1,054	-28	-2.6%	80	70	-11	-13%	1,705	1,570	-136	-8%
Southern Water	2,353	1,917	-437	-19%	2,716	2,437	-279	-10.3%	226	185	-41	-18%	5,296	4,539	-757	-14%
Thames Water	3,681	3,562	-119	-3%	5,970	4,310	-1,659	-27.8%	525	290	-235	-45%	10,176	8,163	-2,013	-20%
United Utilities	1,195	1,075	-120	-10%	5,287	4,509	-777	-14.7%	337	340	3	1%	6,818	5,924	-894	-13%
Wessex Water	281	244	-37	-13%	2,118	1,688	-430	-20.3%	157	116	-41	-26%	2,556	2,048	-508	-20%
Yorkshire Water	506	576	70	14%	2,397	2,287	-111	-4.6%	114	123	8	7%	3,018	2,985	-32	-1%
Affinity Water	720	679	-41	-6%									720	679	-41	-6%
Bristol Water	186	135	-51	-27%									186	135	-51	-27%
Portsmouth Water	214	209	-5	-2%									214	209	-5	-2%
South East Water	761	566	-194	-26%									761	566	-194	-26%
South Staffs Water	152	163	12	8%									152	163	12	8%
SES Water	58	46	-12	-21%									58	46	-12	-21%
Total	16,706	15,460	-1,247	-7%	29,985	26,217	-3,767	-12.6%	2,282	1,935	-347	-15%	48,973	43,612	-5,360	-11%

Table 55: Total allowances versus requested – after frontier shift and real price effects – £million 22-23 prices

Company	Wholesale water				Wastewater network plus				Bioresources				Retail (residential retail + non-household retail)				Total			
	Company proposal	Our view	Our view minus company proposal		Company proposal	Our view	Our view minus company proposal		Company proposal	Our view	Our view minus company proposal		Company proposal	Our view	Our view minus company proposal		Company proposal	Our view	Our view minus company proposal	
			£m	% of company proposal			£m	% of company proposal			£m	% of company proposal			£m	% of company proposal			£m	% of company proposal
Anglian Water	5,030	4,851	-179	-4%	5,014	5,002	-11	0%	622	616	-6	-1%	514	501	-13	-2%	11,180	10,971	-209	-2%
Dŵr Cymru	2,387	2,308	-79	-3%	3,015	3,054	39	1%	321	315	-6	-2%	298	320	22	7%	6,021	5,997	-25	0%
Hafren Dyfrdwy	191	193	2	1%	59	53	-5	-9%	3	4	1	25%	17	17	0	-2%	269	266	-3	-1%
Northumbrian Water	3,001	2,910	-91	-3%	2,831	2,688	-143	-5%	219	231	12	6%	314	325	11	3%	6,365	6,153	-211	-3%
Severn Trent Water	6,280	6,149	-131	-2%	7,499	6,901	-598	-8%	1,196	1,138	-58	-5%	714	729	14	2%	15,689	14,917	-772	-5%
South West Water	1,581	1,553	-28	-2%	1,889	1,889	0	0%	297	232	-65	-22%	174	173	-1	0%	3,941	3,847	-94	-2%
Southern Water	3,787	3,179	-608	-16%	4,933	4,537	-396	-8%	469	458	-11	-2%	426	356	-69	-16%	9,614	8,530	-1,084	-11%
Thames Water	10,374	9,732	-642	-6%	11,237	8,651	-2,586	-23%	1,757	1,054	-704	-40%	1,099	1,028	-71	-6%	24,467	20,464	-4,003	-16%
United Utilities	4,485	4,389	-96	-2%	8,057	7,428	-629	-8%	840	845	5	1%	645	650	5	1%	14,027	13,312	-715	-5%
Wessex Water	1,167	919	-247	-21%	3,269	2,810	-459	-14%	460	303	-157	-34%	190	199	9	5%	5,086	4,231	-854	-17%
Yorkshire Water	3,173	2,965	-208	-7%	4,277	4,422	145	3%	455	514	59	13%	441	444	3	1%	8,345	8,345	0	0%
Affinity Water	2,245	2,174	-71	-3%									160	167	8	5%	2,404	2,341	-63	-3%
Bristol Water	681	644	-36	-5%									65	65	0	0%	745	709	-37	-5%
Portsmouth Water	431	443	13	3%									27	28	0	1%	458	471	13	3%
South East Water	1,979	1,714	-265	-13%									125	107	-18	-14%	2,104	1,821	-282	-13%
South Staffs Water	815	851	35	4%									67	75	8	12%	882	926	43	5%
SES Water	390	328	-62	-16%									37	38	1	2%	428	367	-61	-14%
Total	47,994	45,302	-2,693	-6%	52,079	47,435	-4,644	-9%	6,639	5,709	-930	-14%	5,313	5,221	-92	-2%	112,026	103,667	-8,359	-7%

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

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