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Reference of the PR19 final determinations: Key elements of the methodology appendix

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Contents

1. Introduction

1.1 In this annex we cover specific elements of our PR19 methodology where we consider it necessary to set out our approach in further detail. We briefly explain our approach to the following elements of PR19:

- two 'upper quartile' common performance commitments – water supply interruptions, and internal sewer flooding;
- two common performance commitments – mains repairs and leakage;
- our expenditure allowances for resilience enhancement;
- our expenditure allowances for the Water Industry National Environment Programme (WINEP); and
- our approach to water resources management plans (WRMPs).

1.2 For clarity, we also explain:

- the definitions of totex we use in our documentation; and
- how we compare our historical and forecast base totex allowances.

1.3 As with the remainder of our submission material, this annex is intended to provide an overview of our approach and does not in any way replace or reproduce the detail contained in the full set of documents which comprised the final determinations.

1.4 We set out further detail around our methodology and decisions relating to these issues in our published documentation. We reference these materials where appropriate below.

2. Water supply interruptions

2.1 Water supply interruptions is one of the three common performance commitments that we set at a common performance level for all companies. Reliable water supplies are highly important to customers. We set out in the PR19 Final Methodology that companies' forecasts should be at least upper quartile for these three performance commitments and if not we expected convincing evidence as to why upper quartile performance could not be achieved. During the course of the price review process we have modified our approach to setting the levels for the performance commitment based on representations from companies and the most recent performance data. This has resulted in substantial reduction in the stretch from the fast track draft determination to the final determination while still targeting a significant degree of improvement for customers.

2.2 The water supply interruptions performance commitment measures the average time of interruptions beyond three hours. They can be planned or unplanned interruptions to supply. Unplanned water supply interruptions are primarily caused by water main bursts, but in most cases only the larger or more complicated mains bursts will actually cause a supply interruption. Planned supply interruptions also arise where work is being carried out on water mains.

2.3 There have been significant improvements in supply interruptions over time. For example, some of the better performing companies have improved by more than 50% between 2012-13 and 2016-17. Performance can be improved through adopting more effective operating practices such as:

- responding more quickly to events by ensuring that initial response teams are sent out faster and are fully trained and equipped to enable supplies to be restored as soon as possible;
- ensuring that mitigation plans are in place with local authorities/land owners for areas where bursts may be difficult to reach;
- improving network monitoring and management, for example, better monitoring enables pressure losses to be detected and located quicker; and
- ensuring better connectivity through removal of single source supply areas or where alternative supplies are not possible.

2.4 For the fast track company draft determinations we set the performance commitment levels for the three companies based on the forecast upper quartile levels (from all companies) in each year between 2020-21 and 2024-25. This provided a glidepath from a performance commitment level of 4 minutes 17 seconds in 2020-21 to 3 minutes in 2024-25. In response to the fast track draft determination and the initial assessment of plans (IAP) several companies, including Anglian Water (but not the other disputing companies), said that these levels were unachievable.

2.5 The evidence provided by companies in response to the initial assessment of plans and a reassessment of the scale of performance improvement in previous periods led us to conclude that while the 2024-25 upper quartile level was achievable, the forecast upper quartile levels in earlier years did not appear to be. In particular, the step change required from current performance to achieve the 2020-21 level set for the fast track draft determinations appeared very challenging.

2.6 As a result, for the slow track and significant scrutiny companies draft determinations, we retained the 2024-25 level at the forecast upper quartile from all companies (3 minutes) but relaxed the starting level and glidepath. The new starting level and glidepath was based on the upper quartile of companies' 2019-20 forecast data (5 minutes 24 seconds) used for 2020-21 and decreasing at an even rate to 3 minutes in 2024-25.

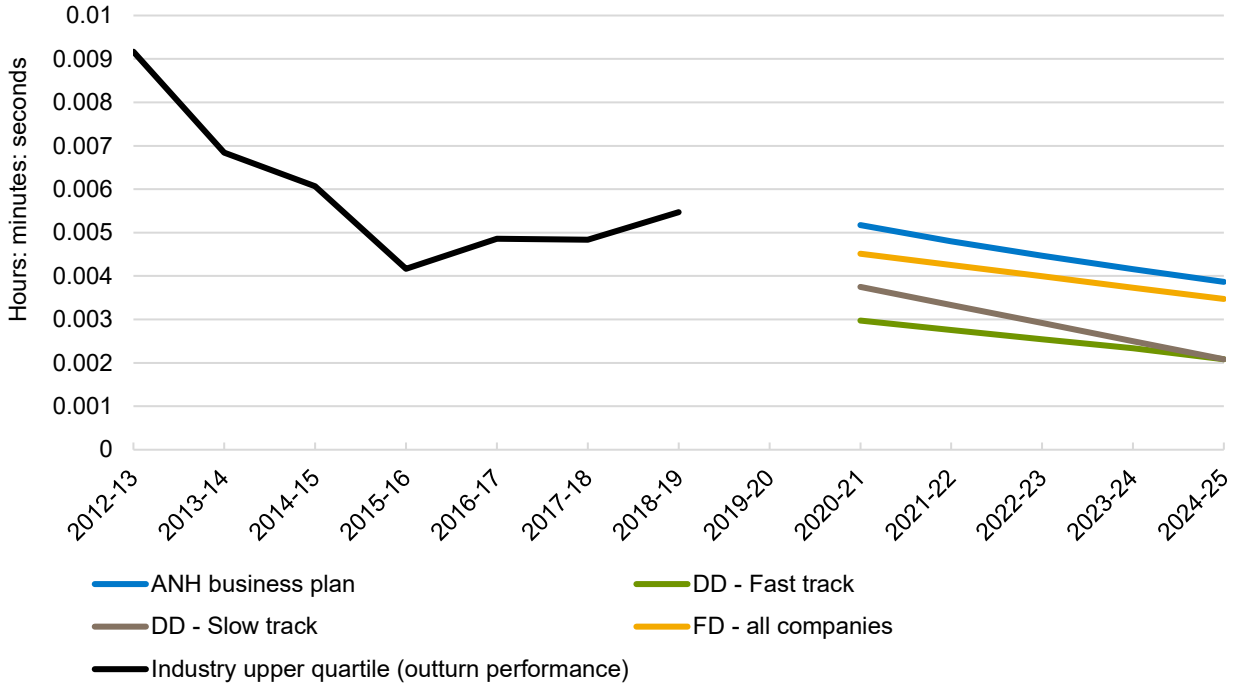
2.7 In response to the draft determinations, several companies including Anglian Water, continued to maintain that whilst the revised glidepath was a step in the right direction, it was still unachievable.

2.8 For the final determinations, we further reassessed our approach to setting the performance commitment levels for supply interruptions taking into account trends in historical data including the newly available information on 2018-19 outturn performance. 2018-19 shadow reporting data (submitted as part of the company annual returns) showed that performance was significantly worse than companies had expected. Figure 2.1 below shows the historical industry average and upper quartile performance, and clearly shows a deterioration in 2018-19 performance and overall deterioration since 2015-16.

2.9 The deterioration in 2018-19 was partly due to extreme weather events in the early part of the year that caused a larger volume of burst mains for some companies. We consider that this was an atypical event and would expect performance in 2019-20 to improve back to normal levels in most areas. However, there can be residual impacts on the network which take time to

correct. Therefore, at final determination we have allowed for some flexibility as it could now be more difficult for some companies to achieve the starting level in 2020-21 set at the draft determination.

Figure 2.1: Water supply interruptions performance commitment levels



2.10 We also conducted a historical trendline analysis using the 2018-19 shadow reporting data and concluded that it would be very difficult for the majority of companies to achieve the 3 minute target. Retaining this target might place the companies in a position of having to radically change their operational practices of how they mitigate and respond to supply interruption events in a very short time frame.

2.11 Our revised approach for determining the common performance commitment levels for supply interruptions was based on using the upper quartile of the last year of actual performance data, which was 2018-19 (7 minutes 21 seconds). We also moved the 3 minute level for 2024-25 set at the draft determination out to 2029-30 (consistent with sector aspiration to move to 3 minute target but over a longer timescale). The final determination performance commitment levels for 2020-21 to 2024-25 were based on a linear profile between these two values (rounded to the nearest 30 seconds).

2.12 This change results in a less stretching performance commitment level of 6 minutes 30 seconds in 2020-21 reducing to 5 minutes in 2024-25, with an associated glidepath that is also less demanding in each year. We consider that this provides performance commitment levels that maintain stretch for the

majority of companies and address achievability concerns by allowing companies time to improve operational practices. We note that two companies (Portsmouth Water and Southern Water) achieved performance better than the 2024-25 level of 5 minutes in 2018-19 and one company (SES Water) beat this level in 2017-18.

3. Internal sewer flooding

3.1 Internal sewer flooding is one of the three common performance commitments that we set at a common level for all companies. We set out in the PR19 final methodology that companies' forecasts should be at least upper quartile for these three performance commitments, and if not, we expected convincing evidence as to why upper quartile performance could not be achieved.

3.2 Internal sewer flooding is flooding that occurs within the boundaries of a customer house or dwelling (flooding outside a dwelling, e.g. in garden, is considered as external). The internal sewer flooding performance commitment measures the number of flooding incidents per 10,000 connections. Internal sewer flooding is one of the worst experiences for a wastewater customer.

3.3 Flooding incidents are caused either by a blockage or collapse of sewer, resulting in restriction in flow which floods up through a manhole, from the ground or potentially through an internal toilet. Often an external flooding event becomes an internal event as escaped sewerage from an external manhole enters the property through an opening such as door or air vent. They can also be caused by lack of hydraulic capacity, where a sewer is effectively not large enough to cope with the amount of sewerage flowing through it. Both these issues can be made worse when there is heavy rainfall as foul and surface water sewers are often cross-connected (and there are also many combined sewers). A smaller number of events can be caused by the failure of pumping stations or other assets on the network that are used to move sewerage through the system.

3.4 We set the performance commitment levels based on the upper quartile of the companies' forecasts in each year between 2021-22 and 2024-25. While this does require a significant improvement in performance by some companies, we consider this approach is well justified. This is because (a) some companies already perform at this level, (b) large improvements in performance have been made by some companies over the last 5 years, and (c) others should be able to adopt similar operational methodologies to improve performance.

3.5 Companies can use a range of methods to improve performance of this measure. These include:

- quicker response to reports of flooding and ensuring the issues are resolved first time without the need for repeat visits;

- better flow monitoring of the network to identify issues before they result in flooding incidents;
- more pro-active clearance of blockages on both critical and non-critical sewers. This can be done through the identification of hotspots e.g. areas or large restaurant density or other public services;
- more CCTV surveying of critical sewers to pro-actively identify blockages and collapses; and
- better logging of incident causes to build up a profile of network condition which could be used to inform risk analyses for hot spot identification.

4. Mains repairs

4.1 Mains repairs is one of the four asset health performance commitments. The volume of mains repairs is a long standing measure and an important indicator of the health of a water company's assets. An increase in the number of mains repairs over time can indicate a deterioration in the health of the network and underinvestment in (or poorly targeted) mains replacement and renewal. There may be a considerable lag between underinvestment in the network and the impact on mains repairs. It is therefore necessary to report on and incentivise performance in this area both to hold companies to account for past expenditure allowances and to protect future customers. Company capital expenditure on their water networks on an annual basis is approximately £800 million, and mains repairs is the key asset health metric used to hold companies to account for this expenditure.

4.2 Our objective with mains repairs is to incentivise companies to minimise the number of mains repairs to provide confidence that the underlying health of the assets is stable and improving. Minimising the number of mains repairs also has a positive impact on vehicle and pedestrian delays, disruption to public and businesses, noise pollution, as well as additional carbon produced during traffic delays.

4.3 The performance commitment measures the number of repairs on the water mains network per 1,000 km and includes mains repairs pro-actively and reactively (planned repairs and unplanned repairs due to reported main bursts). It is a proxy measure for the number of mains bursts, but because many mains bursts are not visible until an excavation has occurred, they are reported as mains repairs.

4.4 Water mains can burst due to movement of the soil in which they are laid. They can burst more when extreme weather causes more ground movement, such as extreme cold or lengthy dry spells. Benign weather tends to result in fewer burst pipes. Mains can also burst due to third party action, e.g. a contractor digging a road for another utility.

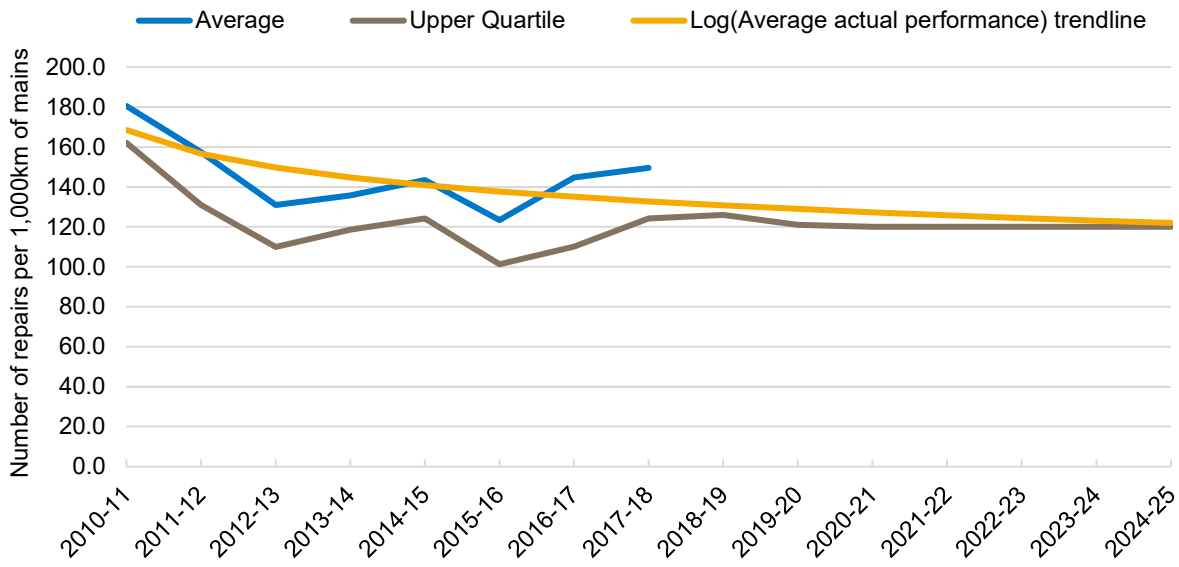
4.5 Companies have to conduct a certain number of repairs to maintain stable performance of the network, including supply interruptions and leakage levels. They also conduct mains renewal or replacement programmes to help achieve these targets and maintain long-term asset health. Mains bursts cannot be eliminated altogether, but performance can be managed by: conducting more and/or better targeted mains renewals/replacements (better risk management),

and through the network management by the use of flow meters and pressure loggers to monitor the network, identify where bursts have occurred and improve network flow and pressure control (smarter networks).

4.6 As with other asset health performance commitment levels, mains repairs is not set at a common level. This is because the current condition and performance of the assets is linked to the underlying characteristics of the network. Whilst considerable investment has been made to bring asset health to a stable condition, water companies have not been expected to reach a common service level. As part of our PR19 methodology, we set expectations that companies would improve their level of asset health.

4.7 We tailored our approach to setting asset health performance commitment levels depending on whether they affected customers directly or not and depending on whether we had good historical data.[1] For mains repairs, we have good historical data because of a reasonably consistent definition and continuous history of reporting). We used the historical data to calculate the average level of mains repairs across the sector in each year. We forecast the expected level of mains repairs for 2020-25 based on the expected rate of improvement from the historical data to assess the stretch of companies proposed performance commitment levels (see Figure 4.1).

Figure 4.1: Historical mains repairs, average and upper quartile



[1] For further detail, see PR19 final determinations: Delivering outcomes for customers policy appendix, section 3.5, pp. 53-70.

4.8 We used the forecast trend to determine what 'good' performance may look like by 2024-25, estimated as 120 repairs per 1000km. This level was used to determine whether we should intervene on companies' proposed performance commitment levels. We considered intervention for any company that proposed a 2024-25 level worse than the 'good' level.

4.9 At draft determination, where we intervened in a company's mains repairs performance commitment level, we set the performance commitment level at the average of the best three years' performance for that company from 2011-12 to 2017-18. We considered that this was achievable, as the company had achieved it at least three times in the last seven years, so it is reasonable to assume that level can be achieved again – but at the same time required the company to improve beyond historical levels of performance.

4.10 We also intervened where companies proposed a deterioration in their performance commitment level even if their current performance was better than our forecast "good level", if the company did not provide sufficient evidence to justify a deterioration from current performance. This affected United Utilities and Severn Trent Water.

4.11 In response to draft determinations, several companies said this approach to mains repairs meant that the level we set was not replicable in the next period because the best historical three years represented years where exogenous factors such as benign weather positively affected their performance. Having undertaken further analysis following the companies' representations, in our final determinations we amended our approach to setting the performance commitment level, basing it on the average of each company's best five years of historical performance (from 2011-12 to 2018-19), rather than the best three years. We consider that this provides a more representative level of good performance required to improve the overall health of companies' assets over the long run. This results in a less stretching performance commitment level in each year, with the precise level of performance commitment levels depending on each company's individual performance.

4.12 Several companies also said that we had not taken account of the link between the leakage performance commitment target and mains repairs, i.e. in order to meet the stretching leakage target, it would be necessary to conduct further proactive mains repairs. However, companies had not provided sufficient evidence to demonstrate this link in their business plan submissions. Therefore, for the draft determinations, we made no allowance in the mains repairs performance commitment levels for leakage reduction and asked companies to provide better evidence. We also noted that there are many other leakage

reduction solutions (such as pressure management, transient event identification and removal, targeted mains replacement and renewal, communication and customer side leakage activity. There are also other emerging capabilities (such as smart networks, 'calm networks' and innovative repair techniques) which could prove to be highly beneficial in reducing leakage. We asked companies to provide further evidence to demonstrate what other activities they were undertaking to reduce leakage other than mains repairs.

4.13 In response to the draft determinations, companies provided further data and analysis (including a report by UKWIR[2]). This additional evidence showed that active leakage control, including 'find and fix' activities undertaken to meet leakage reduction targets, can contribute to a higher volume of mains repairs. However, there was also evidence provided to show reactive mains repairs reduce at the same time offsetting the increase from pro-active repairs. The evidence supplied also varied as to the expected impact of proactive mains repairs on leakage in terms of megalitres per day reduction. Many companies did not present any evidence on this key relationship at all and several proposed to improve their leakage performance without increasing mains repairs.

4.14 Overall, although the evidence from companies did not allow us to make a precise assessment of the impact, we were sufficiently convinced that there is a link between mains repairs and leakage levels. However we fully expect additional mains repairs to be part of a holistic strategy to reduce leakage in the most efficient and effective way. We therefore further increased the level of the mains repairs performance commitment levels in our final determinations for all companies by a reducing percentage in each year of the 2020-2025 period, thereby reducing the degree of stretch.[3] This affords companies more flexibility in earlier years to deliver a step change in leakage by conducting additional proactive mains repairs as part of their holistic strategy to reduce leakage.

[2] See V001: UKWIR The Impact of Reductions in Leakage Levels on Reported and Detected Leak Repair Frequencies.
[3] See Ofwat, 'PR19 final determinations: delivering outcomes for customers policy appendix', section 3.5.2, pp. 57-62.

5. Leakage

5.1 The volume of water of lost through leakage is a key area of concern for customers, companies and regulators. Reducing leakage levels is important for ensuring resilient future supplies as we are faced with challenges such as climate change and population growth. Lower leakage levels also support the reduction in abstractions that are harmful to the environment. Many customers see reductions in leakage as a prerequisite to taking steps to reduce their own water consumption.

5.2 Over the past two decades, despite material technological progress, many companies have made limited progress in reducing leakage, with no overall reduction in leakage at the sector level. The current level of leakage is approximately 21% of total water supplied by the industry. Companies have committed to reduce leakage by 50% by 2050.[4]

5.3 Leakage is one of our common performance commitments. But we did not set a common leakage performance commitment level or common leakage reduction percentage across all companies. We recognised that an individual company's leakage performance level is influenced by factors such as historical performance to date, its long-term programme of investment activities and its supply demand balance position.

5.4 Nevertheless, we challenged companies to reduce leakage by 15% in our PR19 methodology. We expected companies to respond to our challenge by demonstrating innovation and ambition on leakage reduction and to propose a performance commitment level which was appropriate for their circumstances.

How we assessed leakage performance commitment levels

5.5 We defined our leakage performance commitment metric in terms of a percentage reduction in three-year average leakage value from the actual 2019-20 position to 2024-25. We adopted a three-year average to smooth variations due to weather.

[4] Companies committed to the 50% reduction from 2017-18 levels in a letter from Water UK to the Secretary of State on 17/10/2018. The reduction was a recommendation from the National Infrastructure commission report, Preparing for a drier future: England's water infrastructure needs, p.13.

5.6 In our final determinations we assessed whether the companies' proposed performance commitment levels were appropriate as follows:[5]

- We compared the companies' normalised forecast upper quartile levels for 2024-25 in relation to leakage per property per day and leakage per kilometre of main per day.
- We considered whether companies demonstrated consideration of appropriate approaches in setting the proposed levels: cost benefit analysis, comparative information, minimum improvement, maximum level attainable, historical information and expert knowledge.
- We considered whether companies provided sufficient and convincing evidence that the proposed levels were stretching and supported by their customers. We expected companies to demonstrate this by considering:
    - how the proposed reduction compared with achieved historical reductions and best ever levels achieved;
    - the quality of their customer engagement and the feedback from the company's Customer Challenge Group (CCG); and
    - companies' understanding of the societal benefits of reduced leakage.
- We considered whether the companies provided well justified reasons supported by their own company specific empirical evidence that achieving a greater reduction than proposed was not attainable.
- We assessed whether the companies achieved a minimum 15% reduction in leakage by 2024-25. This was defined as a reduction in leakage of 15% compared to 2019-20 performance commitment levels as specified in our PR14 final determinations.[6]

Our approach to setting a cost allowance for leakage reduction

5.7 Consistent with what we have said in our PR19 methodology, we expect the majority of companies to deliver their leakage performance commitments through their base cost allowance. We do not consider that leakage reduction should come at an additional expense to customers.[7]

5.8 For our final determinations, we reviewed the proposed performance commitment levels of companies. We considered whether the reductions were deliverable within our base allowance and adjusted the performance commitment levels where we considered them to be too challenging. We

[5] PR19 final determinations: Delivering outcomes for customers policy appendix, pp. 34-37.
[6] Considered on an annual average basis rather than three-year average basis because this was the most commonly adopted format for PR14 performance commitments.
[7] See PR19 final determinations: Policy summary, p.14.

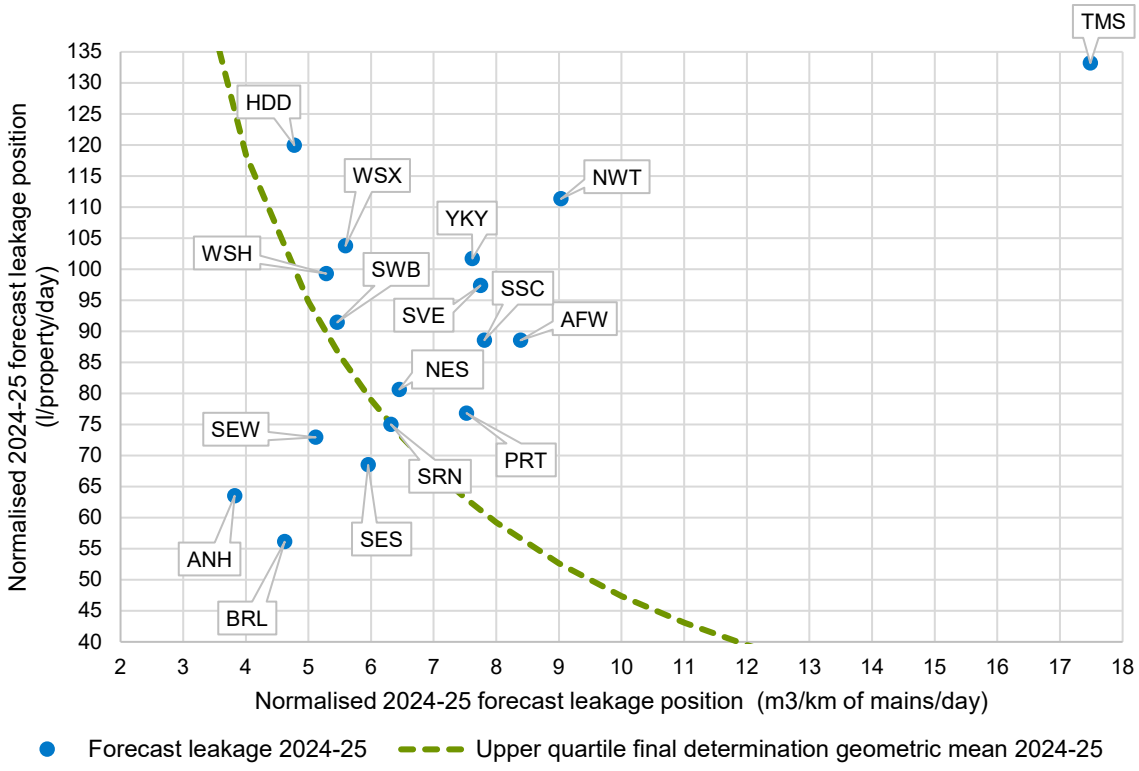
adjusted to levels that we considered to represent appropriately stretching performance for the company.

5.9 In addition to our base allowance, we made an enhancement expenditure allowance for high performing companies to further reduce leakage beyond industry leading levels. To determine whether the allowance should be given, we undertook the following steps:

- For each company we calculate the three-year average leakage forecasts for the period 2019-20 to 2024-25.
- For each company we calculate two normalised leakage measures, leakage per property per day (l/prop/d) and leakage per kilometre of mains per day (m3/km/d).
- For each company we calculate the geometric mean of the two standardised measures.
- Using the 17 geometric means, one for each company, we calculate the upper quartile level for 2024-25 and use this as our benchmark threshold for leakage enhancement funding.
- Companies beyond this threshold were provided with the allowance.

5.10 Four companies demonstrated industry leading performance in their 2024-25 forecast leakage position and were granted the allowance. These were Anglian Water, Bristol Water, South East Water and SES Water (see Figure 5.1).

Figure 5.1: Company forecast 2024-25 leakage position, relative to the enhancement allowance threshold



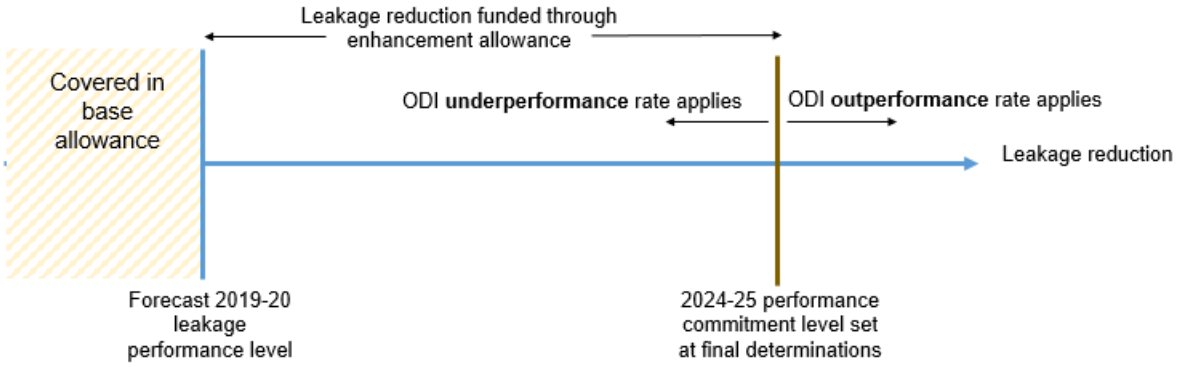
How we determined what performance the enhancement funding should cover

5.11 We expected all four companies to maintain their 2019-20 forecast leakage levels with their base model allowances. If the 2019-20 forecast was beyond our benchmark threshold, we made an allowance for any further leakage reduction beyond the 2019-20 forecast up to their 2024-25 performance commitment levels. This was the case for Anglian Water, South East Water and Bristol Water. For these three companies, the performance commitment levels were aligned with the WRMPs.

5.12 The performance levels that this funding covers for these companies is represented in figure 5.2 below. The underperformance rate claws back the enhancement funding, such that if the company does not improve from the forecast 2019-20 level, all funding is returned to customers. A different rate is applied for degradations in performance beyond that point. Outperformance payments incentivise companies to go beyond the performance commitment level. Further detail of how we set the incentive rates is provided in our

published documentation.[8] For Anglian Water, further details are provided in 'Explanation of our final determination for Anglian Water' (paragraphs 2.63 to 2.69).

Figure 5.2: Representation of leakage performance commitment level setting at final determinations for companies receiving enhancement expenditure



5.13 If the 2019-20 forecast was not beyond our threshold, but the 2024-25 performance level was (i.e. the threshold was between the forecast 2019-20 level and the 2024-25 performance commitment level), we made a partial allowance to cover performance from the threshold up to the 2024-25 performance commitment level. This was the case for SES Water.

How we determined the amount of enhancement allowance for leakage reduction

5.14 We recognise that costs for leakage reduction may vary between companies. Consequently, our enhancement allowance is largely based on the unit cost proposed by the company (times the volume covered by the enhancement funding).

5.15 To ensure that companies' proposed costs are efficient, we challenged them where their unit costs for leakage reduction were higher than the industry median unit cost.[9] Where a company provided insufficient explanation to justify

[8] See PR19 final determinations: Delivering outcomes for customers policy appendix, section 4.5.1, pp. 115-116.
[9] Unit costs for leakage reduction are calculated in Wholesale Water Enhancement feeder model: Supply demand balance. Leakage benefits associated with metering expenditure are removed from our consideration of unit cost. Metering expenditure was assessed in Wholesale Water Enhancement feeder model: Metering.

its higher costs, we applied the company-specific efficiency factor to the enhancement expenditure requested.[10] This resulted in a relatively modest reduction for Anglian Water.

5.16 Our enhancement leakage allowances are included in the individual company deep dive sheets of the supply demand balance enhancement model and summarised in the 'Securing cost efficiency technical appendix'.[11]

Final Performance Commitment Levels

5.17 We summarise the position for each company in our final determinations in Table 5.1. We compare our final determinations to the companies' requests in April 2019 and in response to our draft determinations.[12]

5.18 We also show the Water Resource Management Plan (WRMP) levels.[13] Within these plans, companies forecast the level of leakage required to maintain a supply demand balance over a minimum of a 25 year period.

5.19 The performance commitment level and WRMP leakage figures in the table are provided as three-year average values in megalitres per day. The percentage reduction refers to the reduction in three year average leakage levels from 2019-20 to 2024-25.

5.20 Cross comparison of water resources management plans (WRMP) and business plan leakage figures and forecasts is complex because companies are currently updating their leakage reporting to comply with new reporting guidelines.[14] Over recent years, companies have been shadow reporting and providing updates on their progress in adopting the new reporting guidance. When companies submitted representations to our draft determinations, no company was yet fully compliant with the new guidance but all were making significant progress towards compliance and are committed to achieving this by April 2020.

[10] Unit costs for leakage reduction are calculated in the Wholesale Water Enhancement feeder model: Supply demand balance. Leakage benefits associated with metering expenditure are removed from our consideration of unit cost. Metering expenditure was assessed in the Wholesale Water Enhancement feeder model: Metering.
[11] See Ofwat, 'PR19 final determinations: Securing cost efficiency technical appendix', p.69.
[12] Leakage levels are from April 2019 company business plan tables, WRMP from App2 and PCL from App1.
[13] See section 8 for further detail on Water resources management plans (WRMPs)
[14] See V002: UKWIR Consistency of Reporting Performance Measures Reporting Guidance – Leakage.

5.21 As described in paragraph 5.7, we based the leakage performance commitments on a percentage reduction from the actual 2019-20 position. We did not use forecast levels as we did with other performance commitments because for leakage these have greater uncertainty due to the transition to the new reporting guidelines. As a result of this decision, the expected level of leakage in 2024-25 from delivering the performance commitments will be uncertain prior to companies reporting their 2019-20 data.

5.22 Recognising the complexities above, we nevertheless undertook a comparison of performance commitment levels for leakage reduction and companies' WRMP levels during business plan assessment. To do this, we had to use company forecast 2019-20 three-year averages and apply the percentage reduction performance commitment levels to these to get a three-year average estimate of 2024-25 leakage levels (see Table 5.1, column 3 below). [15] Because WRMP leakage levels are recorded as annual average leakage levels we needed to convert these to three-year averages to complete the comparison (see Table 5.1, column 2 below).[16]

Table 5.1: Comparison of WRMP and performance commitment leakage levels at draft determinations

Company	WRMP 2024-25 April 2019(Ml/d)	Requested PCL 2024-25 April 2019 (Ml/d)	Requested PCL 2024-25 April 2019 (%)	PCL set at DD (%)	Requested PCL DD representat-ions (Aug 2019) (%)	PCL set at FD (%)
Anglian Water	149.2	169.6	7.8%	7.8%	12.7%	**16.4%**
Dŵr Cymru	148.2	148.2	13.3%	13.3%	13.3%	**13.3%**
Hafren Dyfrdwy	12.9	12.9	12.4%	12.4%	12.4%	**12.4%**
Northumbrian Water (Northumbrian region)	121.9	121.9	11.0%	11.0%	11.0%	**11.0%**
Northumbrian Water (Essex and Suffolk region)	53.8	53.8	18.5%	18.5%	18.5%	**18.5%**

[15] 2019-20 actual 3 year averages will be the base level to which the performance commitment level percentage reductions are applied but these will only be known after the year end April 2020.
[16] Annual average leakage is defined as the sum of distribution system leakage, including service reservoir losses and trunk main leakage plus customer supply pipe leakage. It is reported as the annual arithmetic mean (referred to as 'average' in the reporting guidance) daily leakage expressed in mega-litres per day (Ml/d).

Company	WRMP 2024-25 April 2019(Ml/d)	Requested PCL 2024-25 April 2019 (Ml/d)	Requested PCL 2024-25 April 2019 (%)	PCL set at DD (%)	Requested PCL DD representat-ions (Aug 2019) (%)	PCL set at FD (%)
Severn Trent Water	332.1	332.1	14.3%	14.3%	14.3%	**14.3%**
South West Water	101.5	101.5	15.0%	15.0%	15.0%	**15.0%**
Southern Water	89.6	89.6	15.0%	15.0%	15.0%	**15.0%**
Thames Water	559.8	568.0	20.4%	25.0%	20.0%	**20.4%**
United Utilities	386.9	386.9	14.0%	14.0%	14.0%	**10.8%**
Wessex Water	68.8	68.8	12.8%	12.8%	12.8%	**12.8%**
Yorkshire Water	182.8	201.8	25.1%	20.0%	15.0%	**15.0%**
Affinity Water	138.2	138.2	22.6%	20.0%	20.0%	**20.0%**
Bristol Water	36.5	36.5	15.1%	15.1%	15.1%	**21.2%**
Portsmouth Water	27.9	27.9	20.1%	20.1%	20.1%	**15.2%**
South East Water	79.1	79.1	9.6%	9.6%	9.6%	**9.7%**
South Staffs Water (South Staffs region)	56.5	56.5	20.5%	20.5%	20.5%	**15.0%**
South Staffs Water (Cambridge region)	11.9	11.9	13.8%	13.8%	13.8%	**13.8%**
SES Water	21.1	21.1	12.4%	12.4%	12.4%	**12.4%**

5.23 At draft determinations, there was alignment for the majority of companies with the exception of Thames Water, Yorkshire Water, Anglian Water and Affinity Water.[17] However, we made further changes at final determinations to these, and other, companies' performance commitment levels. Where these changes meant that the performance commitment levels at final determination align with the levels requested by companies in their April 2019 business plans we consider that there is likely to be alignment with the WRMP. Below we discuss

[17] See PR19 draft determinations: Delivering outcomes for customers policy appendix, pp. 29-30. PR19 draft determinations: Anglian Water – Delivering outcomes for customers actions and interventions, p. 7.

where April 2019 business plan performance commitment levels differ from final determination levels and give the rationale.

5.24 For Anglian Water, Bristol Water and South East Water, at final determinations, following the additional enhancement allowance provided, we made further changes to explicitly align performance commitment levels and the WRMP.[18]

5.25 The remaining companies with final determination levels that differ from the April business plans were not explicitly aligned with the WRMP, and, as above, are not easily comparable. However, funding for additional reductions beyond performance commitment levels is provided through outperformance incentive payments.

5.26 For Thames Water, we revised its performance commitment level to make it broadly consistent with the legally binding undertaking that it gave to Ofwat in 2018 under section 19 of the Water Industry Act 1991. This reduction of around 20% is less than the 25% reduction set at draft determinations.

5.27 For Yorkshire Water, we accept the company's proposal of a 15% reduction on a three-year average basis to be delivered through its base allowance. This is expected to deliver at least a 15% improvement on PR14 levels. It is a reduction on the 25% proposal in the April business plan, and the 20% reduction set at draft determinations, for which they requested additional funding.

5.28 For Portsmouth Water, South Staffs Water and United Utilities we set performance commitment levels which are less stretching than the company's April 2019 revised business plan proposal but consistent with the wider sector challenge to reduce leakage with base cost allowances. This is expected to deliver at least a 15% improvement on PR14 levels, but may be below the WRMP levels.

[18] Further specific details on the changes made to the Anglian Water leakage performance commitment between our draft and final determinations are included in 'Explanation of our final determination for Anglian Water'.

6 Investment to enhance resilience

6.1 Resilience was a key theme of the 2019 price review. The theme reflected the priorities set by the UK and Welsh Governments in their Strategic Policy Statements, as well as the additional duty for Ofwat to further the resilience objective, introduced by the Water Act 2014.

6.2 However, resilience is not a new concept for the sector. The Water Industry Act 1991 sets out general duties with respect to the water industry which requires water and sewerage undertakers to provide and maintain standards of performance for their water supply and sewerage systems. To support these duties, companies have invested, and will continue to invest, in resilient water and wastewater infrastructure through base cost allowances.

6.3 We worked closely with the sector to develop our approach to resilience for PR19, establishing an independent task and finish group in 2015 to help the sector and Ofwat develop their approach to resilience. Resilience in the round was identified as a key theme for PR19 and our 2017 methodology statement set out our approach to resilience in the price review. This included developing new, risk based outcome performance commitments on drought and sewer flood resilience and requirements for Boards to provide assurance on approaches taken to secure operational, corporate and financial resilience, along with our approach to making allowances for enhancing resilience.

6.4 We define resilience as the ability to cope with, and recover from, disruption and anticipate trends and variability, in order to maintain services for customers and protect the natural environment now and in the future. As a consequence, resilience is a broad concept that spans on-going expenditure to maintain services as well as enhance them. For example, our investments in the supply-demand balance enhancement area improve drought resilience, while those driven by the Security and Emergency Measures Direction (SEMD) enhance resilience of supplies in the event of an emergency situation. Our modelled base allowances are for companies' day-to-day activities, which maintain operational resilience.

6.5 At PR19 we also allowed companies to propose investment to enhance resilience to address risk that was not covered by another enhancement area. Under the category of 'resilience enhancement', we accepted new proposals to fund improved service resilience in the face of low probability, high consequence events, including expenditure to meet new, more onerous

requirements arising from the National Flood Resilience Review.[19] We consider that cost beneficial schemes to address low probability events are not adequately covered in our base allowance.

6.6 We also require that the low probability event that the investment seeks to address is beyond management control. We consider that there may be instances in which such risks can be brought within reasonable and effective management control, for example through appropriate system monitoring and operation in combination with incident response planning. Such activities are routine and therefore associated expenditure is included in base allowances. Consequently, we do not consider that low probability and high consequence risks that can be brought within management control should be funded through enhancement expenditure.

6.7 Following our draft determinations, we received one representation on our assessment criteria and its consistency with our resilience duty in regard to customer support for investment. We advised that we welcomed company engagement with customers on their proposed resilience investments, however, this does not remove company responsibility for understanding and effectively mitigating risks to resilience. Consequently, we did not consider that customer support alone could justify investment.

6.8 For each proposed investment in enhanced resilience, we sought evidence of:

- the specific cause of service failures and associated probability of failure the investment is proposing to address;
- the consequence of failure to customer service;
- how the failure and the consequence are currently beyond management control; and
- that the proposed investments are not for activities included in our base cost allowances, for example capital maintenance.

6.9 Our final determination allowances reflected investment of £643 million (£463 million plus £180 million as a conditional allowance for Thames Water) for sufficiently evidenced proposals that improve resilience for customers and the environment. In instances in which we did not make allowances, we considered that companies had not sufficiently demonstrated their understanding of the resilience risk they proposed to address, particularly the likelihood and consequence of the failure. In concluding on our allowances we also considered our initial assessment of business plans and subsequent resilience action plans, in which many companies fell short of our expectations, in

[19] See National Flood Resilience Review.

particular highlighting a range of weaknesses in identifying and mitigating risks to resilience. This is discussed further in the box below.

6.10 Where we made a material allowance for a resilience enhancement investment, we assessed whether bespoke performance commitments were required to protect customers against non-delivery of the specific investments.

6.11 We gave detailed company-specific feedback in our draft determinations on which proposals passed our criteria for the need for the investment in enhanced resilience, and where information was insufficient.

6.12 Based on our feedback, most proposals for enhancement expenditure for on-going activities, such as updating or replacing equipment, which are funded from within base costs, were withdrawn. This helped to ensure that customers do not pay twice for existing service levels to be maintained and that all companies are funded on a consistent basis.

6.13 Many companies revised their proposals and for final determination they provided better evidence to demonstrate the need for investment in enhanced resilience. In addition to the evidence we received during formal submissions we continued to engage with companies to obtain new information where we considered an investment might be eligible for funding as resilience but for which there remained insufficient evidence to establish the need. We considered all of the evidence and considered it was sufficient to demonstrate the need for a small number of investments in addition to those funded at draft determination. Typically companies only demonstrated the need in part and we therefore made partial allowances where we had sufficient evidence to determine an appropriate value for the investment.

Securing long-term resilience: initial assessment of plans

As part of the initial assessment of plans, we assessed the quality of each company's proposed approach to securing long-term resilience in the round.[20] We considered how well each company identified and prioritised the risks to its systems and services as well as how well it assessed and selected from a range of mitigation options. Anglian Water, Bristol Water, Northumbrian Water and Yorkshire Water all received 'C' grades for this test area, indicating that their plans fell short of high quality, with insufficient or unconvincing evidence in some areas.

Overall, we had significant concerns around companies' ability to demonstrate that they had a framework in place to secure resilience in the round. We therefore requested that all companies developed and submitted specific action plans to demonstrate that tangible and appropriate measures were in place. There was significant variation in the level of detail, robustness and credibility of the action plans that were submitted. Bristol Water's submission met our expectations in most but not all areas, while Anglian Water and Yorkshire Water continued to fall short of expectations in several areas. Northumbrian Water provided a limited plan that fell significantly short of expectations in many areas.

[20] See PR19 initial assessment of plans: Summary of test area assessment, section 7, pp. 58-67 for further details on our assessment of long-term resilience.

7 Water Industry National Environment Programme (WINEP)

7.1 Water companies have statutory obligations to deliver environmental improvements, principally driven by environmental targets set out in legislation. For companies operating in England, the Environment Agency sets out these obligations in the Water Industry National Environment Programme (WINEP). These obligations protect and improve the environment including bathing waters, shellfish waters and other conservation areas and, in addition, cover issues relevant to water companies such as intermittent discharges of wastewater to rivers and coastal waters.

7.2 Companies submitted business plans with their proposed costs to deliver WINEP for 24 separate areas of investment, such as schemes to reduce phosphorus from the effluent of wastewater treatment works, mitigate the transfer of invasive non-native species and minimise the impacts of abstractions of water for water supply for customers.

7.3 Given the statutory nature of the requirements, **we do not challenge the need of company proposals under WINEP**. However, we assess the efficient delivery of the programme and intervene where they fall short.

7.4 We assessed investments to meet environmental obligations in wastewater mainly using benchmarking analysis. The use of benchmarking analysis was enabled due to the relatively homogenous nature of investment in the wastewater service. Our benchmarking analysis was based on econometric models or a comparison of unit cost using companies' forecast data for the period 2020-25. Where feasible, we used cost drivers that are independent of any specific solution, to avoid treating certain solutions preferentially to others. This encourages efficient innovation. In developing our econometric models we tested a range of different cost drivers, and often triangulated a number of models in deriving our view of efficient cost. This ensured we considered a wide range of feasible drivers and limited any potential risk of bias. As always, we complemented our top down benchmarking analysis with a 'deep dive' assessment where a company provided evidence of exceptional circumstances as to why the model was not accurately predicting their requested costs.

7.5 In the water service, and in certain areas of wastewater, benchmarking analysis was not suitable due to the wide range of solutions, often with location specific cost drivers. To assess investment proposals in areas where we did not use benchmarking analysis, we used a deep dive assessment, whereby we

examine evidence presented by the company on the need and efficiency of the proposals.[21]

7.6 For the wholesale wastewater service, we took a programme level approach to setting an efficient allowance, rather than estimate efficient cost within each enhancement area on a stand-alone basis. Specifically, for the environmental programme in wastewater we set allowances as follows: [22]

1. We sum the output of our assessment of all the individual lines. This is our view of average costs, before an efficiency adjustment.
2. We apply a 'catch up' challenge to our view of costs from step 1 based on the "upper quartile" efficient company (this is a notional company whose proposed programme costs are between the third and fourth lowest across the 10 large wastewater companies (we excluded Hafren Dyfrdwy from the determination of a catch up challenge due to its small size)). Our catch up challenge means that three of the 10 wastewater companies proposed to deliver the wastewater environmental programme more efficiently than our benchmark.
3. We apply a frontier shift challenge of 1.1% per year (equal to 2.64% over the period).
4. For each company, we set an allowance that is the minimum of our programme level view of efficient costs (per step 3) and the company requested costs.

7.7 This approach mitigates the risk of setting unduly stretching target due to differences in the approach to cost allocations companies may make between different areas. It also takes better account of the variance in the accuracy of individual models. The approach means that if a company was considered inefficient in one area based on a specific model, and efficient in another area, the outcomes would offset each other to some degree.

7.8 At the time of setting out our final determination a significant proportion of WINEP requirements were not yet confirmed as being required by the Environment Agency and so may not go ahead in the 2020-25 period. To protect customers, we introduced a mechanism to manage this uncertainty. We set our allowance based on the full extent of the programme a company anticipates being required by 2025. Companies were required to link their unconfirmed requirements to an outcome and a unit cost. We will use these unit costs, specific to each company, to make an adjustment at the end of the price

[21] We describe the deep dive assessment process in Ofwat, 'PR19 final determinations: Securing cost efficiency technical appendix', section 4.1, pp. 48-56.
[22] See Ofwat, 'PR19 final determinations: Securing cost efficiency technical appendix', p. 84 for further details.

control period for schemes that are not confirmed as being required (or are confirmed, but not delivered).

7.9 Most companies proposed bespoke performance commitments related to the delivery of the WINEP and NEP (the National Environment Programme for companies in Wales) in their business plans, for example relating to the timely completion of delivery of specific schemes or the overall programme or the benefits delivered. Generally, these performance commitments had associated financial outcome delivery incentives. At final determination, we considered that performance commitments with specific service levels for the delivery of WINEP or NEP schemes should, in general, only apply to schemes designated as green (or 'confirmed' schemes) schemes by 1 April 2019 and not amber (or 'uncertain') schemes. However, some exceptions were considered. We also added an additional reputational performance commitment for all companies in relation to WINEP and NEP. The purpose of this was to provide transparency on whether companies meet all of their WINEP and/or NEP obligations or not each year. This has a binary measurement of 'met' or 'not met' each year. Further details on our approach to WINEP/NEP performance commitments are provided in our final determination documents.[23]

[23] See Ofwat, 'PR19 final determinations: Delivering outcomes for customers policy appendix', section 6.3, p. 141.

8 Water resources management plans (WRMPs)

8.1 Water companies have a duty to develop and maintain their water supply systems and to make the necessary arrangements to be able to meet their water supply obligations. As part of this duty, every five years companies must prepare a water resources management plan (WRMP).

8.2 A WRMP is a long term plan setting out how a water company will manage and develop water resources in its area. WRMPs should ensure that, over a minimum 25 year period, supply and demand balance and customers have a resilient supply. The WRMPs focus on drought events where available water is at its lowest, but demand at its highest. Companies, following discussions with customers, propose a level of drought resilience within their plans for approval.

8.3 The latest set of plans, WRMP19 is the fifth round of the process. Working with the other regulators, we contributed to the water resources planning guidelines that companies followed in preparing their plans. Each government (Defra and Welsh Government) also set out policy expectations for companies to address in their guiding principles for water resources planning documents.[24] [25]

8.4 The WRMP process is statutory and the Secretary of State for the Environment approves the WRMPs for English companies and the Welsh ministers for Welsh companies.[26]

8.5 If a company identifies it cannot meet demand during a forecast drought event, then there is a potential supply-demand balance deficit. This means new options are required to maintain resilient supplies through either reducing water demand and/or increasing water supply.

8.6 Options can be either supply-side (such as boreholes or reservoirs), which increase the amount of water available, or demand-side, which reduce the amount of water required (water efficiency activities or leakage reduction). The companies initially produce a draft WRMP providing detail of their preferred options to maintain their proposed level of drought resilience.

[24] Defra, 'Guiding principles for water resources planning', May 2016.
[25] The Welsh Government Guiding Principles for Developing Water Resources Management Plans (WRMPs) for 2020, April 2016.
[26] If companies have plans that affect sites in both England and Wales, they must send the WRMPs to both the Secretary of State and the Welsh Ministers.

8.7 As a statutory consultee of the draft plans we undertook detailed technical reviews of the WRMPs, publishing our consultation responses[27] and sharing findings with the companies, environmental regulators and government.

8.8 The WRMPs are a key input to water company business plans and the majority of draft WRMPs were available prior to the companies' initial business plan submission. In our responses to company draft WRMPs, we set out a clear challenge in areas where more evidence was required to convince us that plans delivered in the best interests of customers and represented best value.

8.9 Further review and approval of the WRMPs for publication took place in parallel to the business planning process. Following our statutory response we provided a further informal response to Defra, the Environment Agency based on the companies' responses to our representations. For plans concerning sites in England the Environment Agency advised Defra and the Secretary of State when plans were suitable for publication. For plans concerning sites in Wales, Natural Resources Wales provided advice to the Welsh Ministers.

8.10 The WRMPs identify investment requirements which form part of the requested expenditure in companies' business plans. In developing a WRMP companies typically start by determining the least cost programme of options which will balance forecast supply and demand, therefore ensuring long term resilience of supplies against drought. Companies that do not forecast a deficit may still consider options for improvement, for example, to achieve wider objectives such as leakage reduction or to increase their surplus to enable water trading. In addition, companies also consider opportunities to deliver further benefits such as resilience to non-drought hazards in order to create a 'best value' version of their WRMP that delivers multiple objectives.

8.11 In their business plans companies typically submitted requests for enhancement expenditure in the areas of supply-demand balance and metering to deliver their WRMP programme.

8.12 Our assessment for supply-demand balance enhancement expenditure was divided into five components to allow better benchmarking across common activities and take into account longer term investment that does not deliver a benefit within the 2020-25 period.

- 2020-25 supply-demand balance enhancement
- Long-term enhancement
- Leakage enhancement (for further details see section 5)

[27] See Ofwat's engagement on WRMP19.

- Internal interconnections (intra-company transfers)
- Investigations and future planning

8.13 Further details of our supply-demand balance components and assessment approach can be found in our final determination documentation.[28]

8.14 Our assessment for metering enhancement expenditure used a cost model complemented by a deep dive assessment for activities not captured by the model explanatory variables.

8.15 We used companies forecast cost data and proposed meter installation numbers to create a cost model. We used this model to make an allowance for new meter installations at properties which did not have an existing meter. The base model separately provided an allowance for the replacement of existing meters.

8.16 Where companies identified significant metering costs outside of new installations or typical replacement activity, such as replacing existing basic meters with smart meters, we undertook a deep dive assessment using the information companies provided. For deep dives, where possible, we benchmarked comparative costs. We assessed the validity of any additional expenditure beyond the modelled allowance, both base and enhancement. Further details of our metering assessment approach can be found in our final determination documentation.[29]

8.17 During our assessment of WRMPs we were extremely concerned that companies had failed to work together to develop regional and national solutions to address long term drought resilience issues. This meant that customers were exposed to the risk of short term approaches and poorly designed and inefficient solutions to improve drought resilience. We highlighted this concern in our information note outlining the key findings from the draft WRMP assessment[30] and in a joint letter with Defra, the Environment Agency and DWI[31].

8.18 Following the initial assessment of business plans, we intervened in the process to provide additional gated funding for companies to develop strategic water resources. This investment will allow companies to jointly assess

[28] See Ofwat, 'PR19 final determinations: Securing cost efficiency technical appendix', p. 65.
[29] See Ofwat, 'PR19 final determinations: Securing cost efficiency technical appendix', p. 79.
[30] See IN 18/12: Draft water resources management plans 2019 - Overview of Ofwat's responses, June 2018.
[31] See Building resilient water supplies – a joint letter from Defra, the Environment Agency, the Drinking Water Inspectorate and Ofwat to water companies, 9 August 2018.

feasibility, address environmental issues and progress through the planning process. These regional and national solutions include new water transfers, new reservoirs, water re-use and desalination plants, which will not deliver benefits in the next five years. We determined allowances for the development of individual strategic solutions as the minimum of either the company-specified costs or 6% of total solution costs (excluding land acquisition, which we assume to be a post-2025 activity). We made an exception where the companies provided sufficient evidence for an alternative allowance. Further details on our approach and expectations for the programme deliverables can be found in our final determination documentation.[32]

8.19 In the allowances we made to companies following assessment of their business plans at the price review we accepted the need to invest in new infrastructure and demand management activities to address WRMP supply demand deficits. We also made allowances for elements of companies' plans beyond the minimum least cost requirements where evidence demonstrating value for money was provided to support the companies' decisions. However, we challenged companies' proposals where this evidence was not sufficiently convincing and where companies' had not sufficiently addressed the concerns made in our draft WRMP representations.

8.20 We assessed business plans in accordance with the UK Government's strategic priorities and objectives (SPS).[33] This sets out the Government's expectation for us to recognise the need to balance supply and demand and achieve the level of service that is set out in the companies' final WRMPs, but also to continue to challenge companies to meet that need in a way that represents the best value for money over the long term, including through the price review.

[32] See Ofwat, 'PR19 final determinations: Strategic regional water resource solutions appendix'.
[33] See 'The government's strategic priorities and objectives for Ofwat', p. 4.

9 Totex definitions and comparisons

9.1 There are two definitions of wholesale totex expenditure which we refer to in our documents. We set out a description below, as well as guidelines on how to reconcile them with other definitions presented in our final determinations.

- Our main definition of wholesale totex is the **sum of base expenditure and enhancement expenditure**.[34] This expenditure forms the baseline of our assessment of cost efficiency, and is used for the calculation of cost sharing rates. We will use this definition of totex in our documentation unless otherwise specified.
- A second definition of wholesale totex allowance **includes all costs**.[35] This includes, in addition to the totex defined above, operating lease adjustments, third party costs, pension deficit recovery costs, non-section 185 diversion costs and allowances related to the development of strategic regional water resource solutions. These items are excluded from our main definition of totex because less suitable for an assessment of cost efficiency due to various reasons.[36]

9.2 In addition to wholesale expenditure, our totex allowance includes an allowance for residential retail expenditure. In most cases we report residential retail expenditure separately.[37] Where we include allowances for residential retail in our main definition of totex, we specify so.

9.3 We use our main definition of wholesale totex to facilitate a comparison of companies' requested expenditure to historical expenditure. We provide further details below on the comparison of historical and forecast base expenditure we assess within our econometric models.

[34] Our main definition of totex corresponds to the sum of base expenditure and enhancement expenditure in Table 3.2 and to the totex presented in Table 3.3 of our final determinations. See, for example, PR19 final determinations: Anglian Water final determination, pp. 37-38.
[35] We present totex including all costs in Table 3.1 of our final determinations. See, for example, PR19 final determinations: Anglian Water final determination, p. 35.
[36] For example, pension deficit recovery costs are not subject to our cost assessment because the approach was set out in 'IN 13/17: Treatment of companies' pension deficit repair costs at the 2014 price review' (October 2013). We exclude non-section 185 diversion costs from our assessment of base cost efficiency because we expect a step change for some companies as a result of large infrastructure projects such as High Speed 2. Companies will be able to recover most of the non-section 185 diversion costs directly, usually from transport authorities, outside of the price control.
[37] In our final determinations we report allowances for residential retail costs separately in Table 3.8. See, for example, PR19 final determinations: Anglian Water final determination, p. 48.

Comparison of historical and forecast base costs

Base costs are routine, year-on-year costs that companies incur in the normal running of their business. As such, base costs lend themselves well to historical comparisons. At PR19 we consider costs driven by population costs ("growth costs") in a similar vein to base costs. These costs are routine and largely driven by the scale of the business.

A comparison of forecast base costs to historical base costs is complicated due to the fact that historically companies did not report opex relating to base activities and opex relating to enhancement activities separately (whereas in for the period 2020-25 companies did distinguish between the two types of opex in their business plan data tables). In essence, we are unable to observe historical base costs because base costs include a component of opex relating to enhancement.

For this reason, and to allow for a like-for-like comparison between historical and forecast costs, we include enhancement opex in historical base costs (due to inability to distinguish and remove enhancement opex) and in forecast base costs (despite being able to distinguish and remove enhancement opex).

Anglian Water's forecast of base costs are significantly higher compared to their historical level. We estimate the increase in Anglian Water's base expenditure between the last five years of historical data (2014-15 to 2018-19) and 2020-25 to be 15.7%. We recognise that there may be different ways to measure the increase in base costs. We obtained the figure of 15.7% by including both base and growth costs in the comparison. If we were to exclude growth expenditure from the comparison, the increase in base expenditure would be 8.8%. Alternatively, we could remove enhancement opex from the company's forecast costs for 2020-25 and remove an estimate of enhancement opex (as we cannot observe it directly) from its historical opex. This will provide a cleaner comparison of base costs, albeit based on an estimation of historical enhancement opex. Whichever method we use, **the increase in base costs requested by Anglian Water for 2020-25 is significant**.

We compared companies' requested base costs to the cost it incurred in the 2014-2019 period. There may be an argument to compare projected costs for the 2020-25 period with the costs incurred in the preceding regulatory period 2015-20. However, as the 2019-20 data on actual spending will not be available until July 2020, this would require the use of forecast cost for the 2019-20 year. Moreover, In the case of Anglian Water in particular, 2019-20 predicts an exceptional level of

spend, which may underestimate an increase in base expenditure in the forecast period.

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

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