



YorkshireWater

PR19 Redetermination

Yorkshire Water Services: Statement of Case

2 April 2020

Foreword: Covid-19

Yorkshire Water's decision to seek a redetermination by the CMA was taken before the emergence of the Covid-19 pandemic. This Statement of Case was prepared on the basis that Ofwat's final determination created risks to customers, to resilience in Yorkshire and to the company, which could not be accepted. Yorkshire Water's analysis of those risks was based on the challenges that the determination posed in what might be described as 'normal operating conditions'.

The impact of Covid-19 has clearly been profound on society as a whole and the potential longer-term implications on water companies and their customers will require further detailed analysis, work which is now underway. This will include: the impact of the current conditions on service to customers, including the delivery of performance commitments; the likely increase in debt from both consumers and businesses unable to pay their bills; changes to activities due to reallocation of resources, resilience of supplies and environmental services; and also the delay in any AMP7 capital schemes which cannot continue safely under present circumstances. It will also look at the likely impact on water company finances caused by these issues.

This Statement of Case does not take the environment in which we now operate into account and clearly nor does Ofwat's final determination. Whilst Yorkshire Water stands by the case it makes in this document, it would seem appropriate to suggest that in the current climate there are measures that either Ofwat or the CMA could take to adjust the final determination and bring this redetermination to a timely conclusion in the national interest.

Yorkshire Water would be happy to discuss with Ofwat and the CMA how this might be accomplished.

A. Introduction

1. In September 2018, Yorkshire Water Services Limited (**YWS**) submitted its business plan to Ofwat for the period 2020-2025 (the **Business Plan**). The Business Plan was arguably one of the most ambitious in the sector and met Ofwat's objectives of driving improvements in service to customers alongside a step change in efficiency.
2. The Business Plan included significant upfront cost efficiency, amounting to an £800m reduction in costs compared to what the same programme would have cost in the previous Asset Management Period (**AMP**).¹ This is against the backdrop of YWS having been acknowledged for some time by Ofwat as a highly efficient company. At PR14 the company outperformed the efficient cost benchmark in water by 5% and was deemed as efficient in wastewater services. This is important to note in the context of Ofwat asking for a step change in efficiency for an already efficient company.
3. The Business Plan included significant improvements to levels of service, such as a 25% reduction in leakage² and a 41% reduction in internal sewer flooding. Pollution incidents would be cut by a third and supply interruptions halved from four to two minutes.
4. The Business Plan was set in the context of a long-term strategy based on five big goals: providing a tailored service to customers, delivering security of water supply in the long term, making a positive impact on the environment, ensuring affordable bills and setting high standards for transparency and openness.
5. The Business Plan and the long-term strategy received high levels of customer support with 86% of customers finding the performance levels, incentives and bill profile acceptable.³
6. The strategy was based on detailed understanding of customers' needs and wants and took close account of the likely future trends in Yorkshire's economy and environment. It was built with long-term resilience and sustainability in mind and drew on the company's long-standing tradition of working closely in partnership with stakeholders in Yorkshire.
7. YWS has proven its resilience over time, both in the way it manages its assets and the way it seeks to build community-based resilience. Investment of £350m in a region-wide, water transfer grid after the 1995 drought provides a high level of security of water supply, which was invaluable in maintaining services to customers during the drought in Yorkshire in the summer of 2018. YWS has a stable asset base and is ISO 55001⁴ accredited. YWS contributes

¹ AMP refers to the five-year period covered by the price control. AMP6 refers to the 1 April 2015 to 31 March 2020 period covered by the 2014 price review (**PR14**), AMP7 refers to the 1 April 2020 to 31 March 2025 period covered by the 2019 price review (**PR19**), and so on.

² This was reduced following the Initial Assessment of Plans (**IAP**) stage – see paragraph 163 et seq.

³ Exhibit 001, YWS, PR19 Business Plan, page 6.

⁴ ISO55001 is the International Quality Standard for Asset Management.

to resilience in the town of Hebden Bridge by lowering reservoirs to attenuate flood risk. Amongst many other activities in the area, YWS works with 200 farmers and the food supply chain in the Derwent catchment to improve soil quality and reduce the use of phosphates, nitrates and metaldehyde in agriculture, thereby removing the need for further investment in water treatment works and improving the environment at the same time.

8. YWS's tradition of working closely with stakeholders in Yorkshire is best illustrated by the project in Hull, Living with Water. This seeks to mitigate the biggest flood risk outside London by developing innovative blue-green infrastructure, which adds to civic amenity, opens up economic development in an area of significant disadvantage and avoids expensive, carbon intensive civil engineering solutions. Living with Water brings together two local authorities: Hull City Council and East Riding of Yorkshire Council, and the Environment Agency and YWS. The Business Plan proposed £28.7m of investment in Hull which would have been used to leverage further investment from other private sector sources.
9. Ofwat's Final Determination (the **FD**), although making some limited concessions in response to YWS's representations on the Draft Determination (the **DD Representations**; the **DD**), is harmful to customers, will damage resilience significantly and is based on flawed methodologies.
10. For these reasons, YWS's Board concluded that its FD was not in the long-term interests of its customers, of Yorkshire or of the company, and has asked for this redetermination by the Competition and Markets Authority (**CMA**).
11. The flaws in Ofwat's Final Methodology (the **Final Methodology**) include the following:
 - (a) Ofwat has misidentified the notionally efficient firm. Ofwat's frontier shift assumption is erroneous and biased upwards, and its application results in a double counting of potential efficiencies.
 - (b) Insufficient costs have been allowed to deliver the mandated service improvements, to address increasing water treatment complexity or to account adequately for increases in other costs drivers. In other words, Ofwat's models do not preserve a cost-output/activity-outcomes correspondence and disallowed costs have been incorrectly characterised as inefficiency.
 - (c) Ofwat's choice of benchmarks are inappropriate and lack cogent evidential support. The uncertainty from its models is significant, resulting in uncertainty in cost predictions and in uncertainty in the identification of benchmark companies.
 - (d) Ofwat does not adequately account for regionally specific factors such as the materially higher than average proportion of cellared properties in the county and the consequent higher risk of internal sewer flooding.
 - (e) The approach to incentives and rewards is skewed to the downside (meaning that YWS is facing significant penalty exposure in AMP7)

and encourages the avoidance of penalty rather than service improvement.

- (f) The cost of capital is set too low and does not reflect the risks which YWS faces.
12. All these issues combine to mean that the costs allowed by Ofwat to run the company are too low and the service improvement targets (and associated penalties) add considerable risk, which is not appropriately recognised. This has significant implications. It drives short-term decisions which are not in the interests of customers, now or in the longer-term. It means that, despite being efficient, YWS cannot expect to receive a fair return and potentially damages perceptions of the company's credit risk by long-term debt investors.
13. If the determination were to stand, some of the harmful consequences on YWS's customers and on the resilience of its infrastructure would be as follows:
- (a) To fulfil its obligations under the Water Industry National Environment Programme (*WINEP*), YWS will have to adopt shorter term solutions that are worse for the environment and less resilient. The programme creates a huge increase in demand for treatment chemicals, resulting in more tankers on the roads in Yorkshire's cities, increasing air pollution, which is bad for customers and places stress on the chemical supply chain.
 - (b) YWS will deliver less activity in terms of hydraulic modelling in order to focus on short-term service improvement. This will be at the detriment of informed decision making, which would otherwise ensure long-term resilient solutions to current and emerging risks. This means customers may receive sub-optimal solutions and strategic planning with local authorities will be less effective.
 - (c) Investment in increasing the capacity of the wastewater network will be limited. Customers are far less tolerant of storm discharges to rivers and water courses, yet the impact of climate change and population growth will make it increasingly likely without such investment.
 - (d) The performance of the water network will be maintained by spending money on relining pipes and patch repairs to meet leakage targets. Sprayed lining is new, but unproven technology over the long term, and whilst cheaper YWS considers it to be a less resilient approach than traditional mains replacement.
 - (e) The billing service to customers will be diminished as meter replacement will become 'fix on fail', which is not best practice. It could also reduce YWS's ability to manage demand accurately and may impact leakage reporting.
 - (f) Innovative partnership projects, such as 'Living with Water' in Hull, will be stifled, and the opportunity to reduce significant flood risk for citizens will be reduced. It is an opportunity missed to promote new

ways of multi-agency collaboration to tackle the resilience challenges of climate change and regeneration.

14. Overall, the FD creates inter-generational unfairness as it pushes the cost of resilience and climate change on to future customers. By deferring the cost, it also increases it. Contrary to the suggestion from Ofwat, YWS categorically does not believe that “*customers should pay more and receive less.*”⁵ Instead YWS wants to create a long-term, sustainable, resilient and efficient business, which delivers the lowest bills for customers. Correcting the flaws in PR19 would not only have a positive impact for customers in AMP7, it would also help to ensure that those flaws are not repeated in PR24.
15. Finally, YWS recognises the potentially very serious consequences of the Covid-19 pandemic for its customers, its operations and the wider economy and society. In order to assist the CMA to bring this redetermination to a timely conclusion in the national interest, YWS would be prepared to engage at an early stage in a discussion of the measures which the CMA could take to adjust the FD.
16. This is a redetermination of Ofwat’s FD pursuant to s.12 of the Water Industry Act 1991 (*WIA91*) and YWS recognises that the CMA will accordingly wish to address a range of issues arising from it both on its own account and because issues will be put to it by other parties. For its part, however, YWS would direct the CMA’s attention to the following matters as having a particular bearing on its decision to seek this redetermination.
 - (a) **Paragraphs 130 to 134:** Ofwat’s “step change” in efficiency challenge at PR19 has resulted in an overall cost and outcomes efficiency challenge beyond what could be achieved by the notionally efficient firm.
 - (b) **Paragraphs 135 to 151:** Ofwat’s approach to setting cost and outcomes targets has created a disconnect between the two.
 - (c) **Paragraph 152 to 187:** Ofwat has made numerous interventions in YWS’s Outcome Delivery Incentives (*ODI*) package: (a) making arbitrary and unjustified changes to many of the individual parameters; (b) replacing the views of YWS’s customers with Ofwat’s own view; and (c) not reflecting the genuine differences between YWS and the rest of the industry.
 - (d) **Paragraphs 188 to 203:** Ofwat’s cost modelling: (a) fails to distinguish inefficiency from other factors; (b) includes inappropriate catch-up efficiency benchmarks; (c) applies a flawed frontier-shift efficiency challenge; and (d) does not take account of all relevant real price effects.

⁵ Exhibit 002, Ofwat, Reference of the PR19 final determinations – Overview (*Ofwat’s Overview*), para. 1.7.

- (e) **Paragraphs 204 to 215:** Ofwat disallowed YWS's revenue adjustment claim to the Wholesale Revenue Forecasting Incentive Mechanism (the *WRFIM*) that resulted from YWS's reliance on Ofwat's guidance during AMP6.
 - (f) **Paragraphs 216 to 281:** Ofwat has (a) set the WACC too low; (b) failed to ensure that the notionally efficient firm can raise finance on reasonable terms; (c) failed to ensure that the notionally efficient firm is investable; and (d) failed correctly to calibrate key incentives such that the notionally efficient firm would be expected to earn the allowed return; and (e) introduced an inappropriate gearing outperformance sharing mechanism.
 - (g) **Paragraph 282:** Ofwat has created a disconnect between risk and return.
17. The remainder of this Statement is structured as follows:
- (a) **Section B** provides a description of YWS and sets out the evidence of its historical efficiency, as recognised by Ofwat.
 - (b) **Section C** outlines the statutory framework to provide the CMA with the necessary context to consider whether Ofwat has appropriately balanced its duties.
 - (c) **Section D** explains Ofwat's approach to PR19, to set the scene and assist the CMA in understanding YWS's concerns with the FD.
 - (d) **Section E** describes the rigorous process that YWS went through to develop the Business Plan and meet Ofwat's requirements for PR19.
 - (e) **Section F** sets out Ofwat's inappropriate interventions in YWS's Business Plan.
 - (f) **Section G** considers the flaws in the FD, as indicated at paragraph 16 above.
 - (g) **Section H** addresses the material harm to YWS's customers, the resilience of its infrastructure and the environment had YWS accepted the FD.
 - (h) **Section I** contains some final remarks on the PR19 process and on the conduct of this redetermination.

B. Description of YWS and its performance against key regulatory metrics

18. YWS provides essential water and wastewater services to around five million customers in the Yorkshire and Humberside region. It does this through a network of 671 water and wastewater treatment works, collecting supplying 1.3bn litres of drinking water and treating 1bn litres of wastewater every day. YWS is a resilient company with an industry-leading clean water distribution grid connecting approximately 95% of its customers, allowing it to optimise its water resources, and re-route supplies when necessary, for the benefit of those customers.
19. YWS has around 4,400 employees and has stewardship of a large area of land in Yorkshire. It has developed strong relationships with the local authorities in Yorkshire and takes its role in supporting communities seriously. While the focus of its expenditure is on its primary activities, it understands its wider role. For example, YWS is working with local authorities and other stakeholders on a range of innovative, sustainable solutions to the threats its region faces, such as flooding, which has become a regular feature. YWS also works with around 200 farmers on peatland restorations and soil management through the Sustainable Futures programme, which is important in protecting Yorkshire's sources of water.
20. YWS has long strived to do the best for its customers in terms of cost efficiency and service performance. It is an active participant in developing and promoting the strategic direction of the water industry and always strives to be responsive to regulatory direction. This is evidenced in a number of ways.

Ofwat has consistently assessed YWS to be efficient relative to other water companies

21. YWS's long track record as an efficient water company is not in dispute in this redetermination. Ofwat's post-FD assessment of efficiency,⁶ confirms this position and indeed it has been the case since PR99 that YWS has been considered to be at or near the efficiency frontier (i.e. the efficiency benchmark for the performance of other water companies).⁷ This is confirmed both by Table 1 below and by the 2014 Bristol Water redetermination where the CMA noted Ofwat's statement that "*two other water companies – Portsmouth Water and Yorkshire Water – both had strong reputations for efficient operation and were no more than 5% below its final determination cost threshold.*"⁸ This suggests that YWS's cost performance is seen as a reference point in validating Ofwat's models.

⁶ See, for example, Exhibit 003, Ofwat's document 003, Cross-cutting issues paper (*Ofwat's Cross-Cutting Issues Paper*), Tables A1.1-A1.4, pages 79-81.

⁷ Ofwat assess companies within 5% of the benchmark company as Band A. Ofwat also divided each band into an upper and lower part to set an efficiency factor for each company.

⁸ See Exhibit 004, Bristol Water plc: A reference under section 12(3)(a) of the Water Industry Act 1991, Appendix 3.1 paragraph 23.

	Pre PR09	PR09	PR14
Water Opex	Band A	Band A (upper)	94.3% totex
Water Capex	Predominantly Band A	99.5%	
Waste water Opex	Band A	Band A (lower)	99.5% totex
Waste water capex	Band A	93%	

Table 1: YWS's banding in prior price reviews.

22. Table 1 shows that:⁹
- (a) In price controls before 2009 YWS was predominantly assessed as a top rated (Band A) efficient company;
 - (b) In 2009 YWS was band A in operational expenditure (*Opex*), efficient in water capital expenditure (*Capex*), and outperformed the efficient Capex benchmark in wastewater by 7%; and
 - (c) In 2014 YWS outperformed the efficient-cost benchmark in water by 5% and was efficient in wastewater.¹⁰
23. In its final report published in 2015 on the South West Water and Bournemouth Water merger, the CMA included a table, reproduced below, which showed water companies' performance on water service from 2000-2009. The table shows companies' relative positions in terms of the quartile of Opex cost performance at which they were then operating (Q1 contains the most efficient companies and Q4 contains the least efficient). As can be seen, with the exception of 2005, YWS was in the upper quartile (Q1) in every year.

Company	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Anglian Water	2	3	2	3	2	2	2	1	1	1
Dwr Cymru (Welsh)	4	4	4	4	4	4	4	4	4	4
Northumbrian Water		2	1	3	3	4	3	2	2	4
Severn Trent Water	3	2	2	1	2	3	3	3	2	3
South West Water	3	4	2	4	4	4	4	4	4	4
Southern	1	1	1	2	1	1	1	2	2	1

⁹ The PR14 assessment considered YWS's performance in AMP5 (2010-2014); PR09 refers to its performance in AMP4 (2005-2009); and pre-PR09 refers to assessments of performance prior to 2004.

¹⁰ Exhibit 005, Final price control determination notice: company-specific appendix – Yorkshire Water, December 2014, pages 16 and 29.

Company	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Water										
Thames Water	1	1	3	4	4	4	4	4	4	4
United Utilities	2	2	2	2	3	4	2	3	3	2
Wessex Water	1	1	1	1	1	2	1	1	1	2
Yorkshire Water		1	1	1	1	2	1	1	1	1
Bristol Water	4	4	4	4	4	3	4	3	4	3
Dee Valley Water	2	3	4	2	2	1	1	4	3	3
Portsmouth Water	1	1	1	1	1	1	1	1	1	1
Bournemouth Water	2	3	4	2	2	1	2	2	1	3
South East Water	4	4	3	3	3	3	3	2	3	2
South Staffordshire										
Cambridge Water	3	3	3	1	1	1	2	1	2	2
Sutton and East Surrey Water	3	2	3	3	3	2	3	3	3	1
Veolia	4	4	4	4	4	3	4	4	4	4

Table 2: Water companies' Opex efficiency ranking by quartile. Source: CMA final report, completed acquisition by Pennon Group of Water Investments Limited, Appendix E, Table 9, page 31.

24. A similar story holds for Capex. As shown in the CMA's table of water firms' Capex efficiency rankings by quartile, reproduced in Table 3, YWS was in the upper quartile for all Capex in all price reviews from PR99 to PR09, with the exception of infrastructure capex in PR04.

Company	PR99	PR04	PR09
Water infrastructure			
Anglian Water	Q2	Q4	Q1
Dwr Cymru (Welsh)	Q3	Q1	Q3
Northumbrian Water	Q2	Q4	Q4
Severn Trent Water	Q3	Q4	Q1
South West Water	Q1	Q1	Q4
Southern Water	Q4	Q3	Q2
Thames Water	Q1	Q4	Q3
United Utilities	Q2	Q1	Q1
Wessex Water	Q1	Q1	Q1
Yorkshire Water	Q1	Q1	Q2

Company	PR99	PR04	PR09
Bournemouth and West Hampshire	Q4	Q4	Q4
Bristol Water	Q4	Q4	Q4
Cambridge Water	Q3	Q4	Q3
Dee Valley Water	Q4	Q4	Q2
Folkestone and Dover Water	Q4	Q4	Q1
Portsmouth Water	Q3	Q4	Q4
South East Water	Q4	Q4	Q4
South Staffordshire Water	Q4	Q3	Q4
Sutton & East Surrey Water	Q1	Q3	Q3
Tendring Hundred Water	Q4	Q4	Q4
Three Valleys Water	Q2	Q4	Q4
Water non-infrastructure			
Anglian Water	Q4	Q4	Q3
Dwr Cymru (Welsh)	Q3	Q1	Q2
Northumbrian Water	Q3	Q4	Q1
Severn Trent Water	Q3	Q1	Q4
South West Water	Q1	Q4	Q4
Southern Water	Q2	Q4	Q3
Thames Water	Q4	Q2	Q4
United Utilities	Q1	Q4	Q1
Wessex Water	Q1	Q1	Q1
Yorkshire Water	Q1	Q1	Q1
Bournemouth and West Hampshire	Q4	Q4	Q4
Bristol Water	Q1	Q4	Q2
Cambridge Water	Q4	Q4	Q3
Dee Valley Water	Q2	Q4	Q2
Folkestone and Dover Water	Q2	Q1	Q4
Portsmouth Water	Q4	Q3	Q4
South East Water	Q2	Q2	Q1
South Staffordshire Water	Q4	Q3	Q2
Sutton & East Surrey Water	Q4	Q4	Q3
Tendring Hundred Water	Q4	Q4	Q4
Three Valleys Water	Q3	Q4	Q4

Table 3: Water firms' Capex efficiency rankings by quartile. Source: CMA final report, completed acquisition by Pennon Group of Water Investments Limited, Appendix E, Table 11, page 32.

25. At PR14, Ofwat also assessed YWS to be efficient in wholesale water and wastewater, and the position on water was confirmed by the CMA's own modelling in the Bristol Water price control redetermination. Indeed, the CMA's modelling results indicated that Ofwat's PR14 models on water

service base expenditure potentially underestimated YWS's cost allowance by 12–23%.¹¹ As a result, the various comments in Ofwat's Overview about the need for water companies to catch up to the efficiency frontier do not relate to historical underperformance in this regard by YWS – indeed Ofwat has repeatedly found to the contrary. This is an important point for the CMA to bear in mind when evaluating the reasonableness of Ofwat's approach to costs, Performance Commitments and ODIs in relation to YWS, and underpins many of the concerns that YWS has with the FD, as set out later in this Statement.

YWS manages its assets in a cost-efficient way and maintains stable levels of asset health

26. YWS categorically refutes the unfounded suggestion to the contrary in Ofwat's YWS-Specific Paper¹², in which this issue has been raised for the first time in the context of this determination. YWS manages its assets in a demonstrably cost-efficient way and maintains stable levels of asset health.¹³ This is demonstrated by Table 4 below, which sets out YWS's performance over the last three AMPs as measured against Ofwat's serviceability measures. YWS has been judged as 'stable' in 55 out of the 60 measures since 2005,¹⁴ and has not seen any deteriorating health in its assets since 2007.¹⁵

¹¹ See Exhibit 004, Bristol Water plc: A reference under section 12(3)(a) of the Water Industry Act 1991, Appendix 4.2, page 38 table 3.

¹² Exhibit 006, Ofwat document 018, Reference of the PR19 final determinations: Explanation of our final determination for Yorkshire Water (the *YWS-Specific Paper*), paragraph 2.6.

¹³ YWS is also accredited to ISO 55001, the international standard for asset management.

¹⁴ Each category in the table denotes overall performance in relation to a set of measures. 'Wastewater networks' performance on sewer collapses, pollution incidents, properties flooded due to other causes, properties flooded due to overloaded sewers, excluding severe weather, sewer blockages and reactive equipment failures; 'Wastewater quality' performance on sewage treatment works non-compliance, population equivalent non-compliance, reactive equipment failures; 'water networks' performance on water treatment works coliform noncompliance, service reservoir coliform noncompliance, turbidity, enforcements and reactive equipment failures; and 'water quality' performance on total bursts, interruptions greater than 12 hours, low pressure, customer contacts for discolouration, distribution index (mean zonal compliance) and reactive equipment failures. Descriptions of these individual performance measures are given in Exhibit 007, Meeting Our Customer Promises: Stability and Reliability Factors https://www.yorkshirewater.com/media/1548/stability-and-reliability-factors-customer-final_0.pdf.

¹⁵ The 'marginal' ratings that YWS agreed with Ofwat on its water networks in 2010-11 and 2011-12 were due to the significant impact of severe weather, specifically the severe winters experienced in those years. For every other metric and for every year since 2007-08 Ofwat has agreed with YWS's assessment of its asset base being 'stable'.

	AMP 4					AMP 5				
	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
WW Networks	Marginal	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable
WW Quality	Deteriorating	Deteriorating	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable
W Networks	Stable	Stable	Stable	Stable	Stable	Marginal	Marginal	Stable	Stable	Stable
W Quality	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable	Stable

	AMP 6				
	2015-16	2016-17	2017-18	2018-19	2019-20 Forecast
WW Networks	Stable	Stable	Stable	Stable	Stable
WW Quality	Stable	Stable	Stable	Stable	Stable
W Networks	Stable	Stable	Stable	Stable	Stable
W Quality	Stable	Stable	Stable	Stable	Stable

Table 4: YWS’s asset health ratings from AMP4 to AMP6.

27. The suggestion in Ofwat’s YWS-Specific Paper that YWS’s apparent cost efficiency may in fact reflect low activity levels in order to be low-cost instead of carrying out its activities efficiently is tantamount to suggesting that an underspend on costs amounts to underinvestment and therefore reflects poor performance. Elsewhere in the FD, however, Ofwat repeatedly (i) states that there is not a trade-off between outcomes and costs;¹⁶ and (ii) seeks to use measures of underspend on total expenditure (*Totex*, being the sum of Opex and Capex) as evidence that companies have outperformed its cost efficiency targets.¹⁷ Ofwat cannot tenably hold both positions.

YWS has a strong track record of meeting regulatory performance targets

28. As regards performance targets, YWS has historically been one of the strongest performing companies regarding cost efficiency (see paragraph 23, above). The company has also invested appropriately in asset health, achieving stability against the basket of 60 serviceability measures used by Ofwat until 2015 (see paragraph 26, above). YWS has continued to perform strongly against the Performance Commitments introduced as part of the outcomes approach introduced for the first time at PR14. The latest Annual Performance Report (*APR*) projects that YWS will meet or exceed 23 of 26 of its PR14 Performance Commitments in 2019-2020.
29. In its submissions in this redetermination Ofwat asserts that YWS is a poor performer in relation to a number of the common performance measures. Ofwat’s characterisation of the background to this is selective and does not provide the CMA with a complete picture. Some additional background and context are provided in the following paragraphs.
30. In fact, YWS has recognised that as part of PR19, Ofwat wished to place greater focus on non-cost comparative performance measures than in previous price controls. A key thrust of YWS’s Business Plan was to deliver exactly

¹⁶ For example, Ofwat states in Exhibit 002, Ofwat’s Overview, at paragraph 4.68 that “*Better outcome performance need not necessarily increase cost. Comparative analysis of company performance shows that it is possible both to be cost efficient and to improve outcomes at the same time.*”

¹⁷ For example, in Exhibit 003, Ofwat’s Cross-Cutting Issues Paper, paragraph 3.49, Ofwat states that “*Our analysis at final determination indicates that it is possible for companies to perform well on costs and meet targets based on (historical) upper quartile levels.*”

this. Indeed, for two of the four key upper quartile (*UQ*) common performance metrics, the FD targets are less ambitious than those the company originally proposed.

31. In addition to failing to mention the increase of regulatory focus on non-cost comparative performance measures, Ofwat's YWS-Specific Paper includes a number of misleading comments with regard to YWS's performance. A number of specific considerations with regard to leakage and internal sewer flooding are highlighted below. YWS will cover the full range of these in due course.

Ofwat's changing approach to leakage not included in base costs

32. Ofwat has substantially changed its approach to leakage in PR19. In previous price reviews, water companies were required to set leakage targets by reference to the 'sustainable economic level of leakage' (*SELL*) and in line with their respective water resource management plans. SELL reflected regionally specific circumstances and the relative balance between supply and demand across water resource zones. Indeed, such was Ofwat's focus on SELL that one of the risk-based review tests applied at PR14 specifically challenged any company that proposed to go beyond SELL to demonstrate strong customer support for doing so.
33. In PR19 Ofwat moved away from setting leakage targets by reference to SELL and instead required companies to achieve at least a 15% reduction in leakage during AMP7. YWS supports Ofwat's desire to reduce leakage in principle: viewed over a long-term horizon, reducing leakage will play an important role in meeting the challenges posed by climate change and population growth. However, as a policy change, the additional costs arising cannot be said to have been part of historic base costs and thus by definition go beyond the economic level previously set by Ofwat. As explained at paragraph 162 below, it is YWS's position that such additional costs must be recognised.
34. It is also important to emphasise that YWS has met (or is forecast to meet) its leakage performance targets in every year of AMP6 save for 2017/18 (where the marginal underperformance was caused by the unusual weather conditions experienced that year). In other words, YWS has historically performed strongly on this measure.
35. Having embraced the challenge in the methodology in response to Ofwat's change of policy, YWS included the efficient costs of reducing leakage in its Business Plan. Ofwat's imputation that this was a recognition of relative poor performance has no basis and is simply misleading.¹⁸ These matters are addressed further in paragraph 162 et seq. below.

¹⁸ Exhibit 006, Ofwat, YWS-Specific Paper, paragraph 1.8.

Ofwat's approach to internal sewer flooding takes insufficient account of specific Yorkshire features

36. As regards internal sewer flooding, Ofwat is more careful to point out that YWS's alleged poor performance in internal sewer flooding is relative to a new measure that it introduced in PR19. In fact, YWS met its performance targets on the previous measure in every year of AMP6. In other words, when compared with Ofwat's previous regulatory standard, YWS has historically performed strongly in this area too.
37. YWS agrees with Ofwat that internal sewer flooding is one of the most egregious failings of a wastewater company and that making improvements in this area should be a priority, as was reflected in its Business Plan. However, YWS does not accept Ofwat's contention that the regionally-specific factors faced by YWS (specifically the high proportion of cellared properties in Yorkshire) should be disregarded when considering its relative performance in this area. Over 70% of sewer flooding instances occur in cellared properties and this substantially impacts on the solutions to prevent future instances and the speed at which they can be deployed. These matters are addressed further in paragraphs 160 et seq. below.

Ofwat's assessment of YWS's efficiency in PR19

38. In marked contrast to the position described at paragraphs 28 to 31 above, in PR19 (at the IAP stage) YWS was judged by Ofwat to be 16.8% and 18.8% above the efficient benchmark in the water and wastewater price controls respectively. Even after the significant adjustments that YWS made at both the IAP and DD stage to resolve the impasse with Ofwat, in Ofwat's view YWS remained 2.1% and 11.5% above the efficient benchmark for water and wastewater respectively.¹⁹
39. Ofwat has implied that because the level of future costs is higher than previously, and because other companies have shown different comparisons, YWS has lost its efficiency edge. However, this view does not recognise the difference between efficiency and activity.²⁰ YWS's Business Plan contains high levels of ambition on Performance Commitments, a very large WINEP programme (imposed on it by the Environment Agency) and starts from a substantially efficient base point (as Ofwat's own analysis confirms²¹). Whereas other water companies may have had large capital programmes, such

¹⁹ Exhibit 008, Ofwat, PR19 final determinations, Securing cost efficiency technical appendix, Table A1.1: Totex, page 158.

²⁰ As is explained later in this Statement, Ofwat's modelling on Botex plus is based on extrapolating historical performance and overlaying its forecast of activities. Its models also ignore Performance Commitments. Thus the 'costs-outputs/activities-outcomes' correspondence is not preserved in its models. This broken link is reflected in the form of gaps as neither on outputs/activities nor Performance Commitment step changes that YWS is anticipating over AMP7 are captured in the models based on historical information.

²¹ See Table 4, above.

as new resilience schemes, to complete in PR14 and so project a fall in expenditure for PR19.²²

Conclusion

40. In summary, YWS is demonstrably an efficient company delivering both the service levels wanted by its customers and responsible stewardship of the significant assets required to do so. Ofwat has not disputed YWS's historical position on efficiency, indeed its submissions to the CMA endorse it notwithstanding its belated attempts to cast doubt on YWS's performance.²³ YWS employed those same efficient costs and methodological rigour to deliver its Business Plan. It enjoys high levels of trust from its customers, receiving over 90% support from customers for each of its five 'Big Goals'.²⁴ These are the five key targets YWS has set itself to ensure it is progressing in line with its Long-Term Strategy.²⁵ A high proportion of residential customers, 86%, found their bills to be acceptable. Moreover, it was clear that while customers felt that WINEP was undoubtedly a large project, they were comfortable to pay for the improvement to their local environment that it would deliver.
41. Consistent with its historical track-record of performance near the efficiency frontier, YWS continued to set itself challenging cost and performance targets in AMP7. Before turning to this in Section D below, however, Ofwat's statutory duties are addressed, followed by its overall approach to PR19.

²² In Annex 10, Oxera quantifies a high degree of uncertainty and lack of confidence in Ofwat's models in terms of cost predictions, identification of benchmark companies, and the benchmark. Hence, Ofwat's conclusions from its cost models are not robust. This is addressed further later in this Statement.

²³ Exhibit 006, YWS-Specific Paper, paragraph 2.5.

²⁴ See below at paragraphs 76 to 84.

²⁵ For more information please visit <https://www.yorkshirewater.com/big-goals/>.

C. Statutory framework

42. It is apparent that Ofwat's approach to PR19 was underpinned by a desire to redress perceived shortcomings in previous price control reviews, in particular by focusing on reducing bills.²⁶ Given the clear tension that could exist between fulfilling its statutory duties and Ofwat's policy considerations, the following paragraphs are intended to provide a more detailed explanation of Ofwat's duties and how they interrelate.
43. Ofwat's power to set price controls for YWS is granted by s.11 of the WIA91. In exercising this power Ofwat must comply with several primary and secondary duties prescribed thereunder. The primary duties should complement rather than conflict with each other and must be given equal weight by Ofwat when reaching its decision.²⁷ As their name suggests, secondary duties are subordinate to primary duties and are to be construed in light of them.
44. Under s.2(2A)(a) WIA91, Ofwat is under a duty to further the consumer objective (the **consumer duty**). This primary duty requires Ofwat to protect the interests of both existing *and future* consumers (as is made clear by s.2(5A) WIA91).
45. This temporal aspect of the duty to further the consumer objective is reinforced by Ofwat's primary duty under s.2(2A)(e) WIA 91 to further the resilience objective (the **resilience duty**) and its secondary duty under s.2(3)(e) WIA91 to ensure that undertakers contribute to the achievement of sustainable development (the **sustainability duty**). The resilience objective includes securing the *long-term* resilience of water supply and sewerage systems and the promotion of long-term planning and investment.²⁸ The interests of both present and future customers are in any case protected by ensuring that YWS can enhance network performance and resilience, and meet its environmental obligations. Furthering the resilience objective is not discretionary. Contrary to the suggestion made to the CMA by Ofwat in the Teach-in sessions on 25

²⁶ For example, as noted in Exhibit 002, Ofwat's Overview: (i) the National Audit Office in 2015 concluded that Ofwat's regime was "*not yet achieving the value for money that it should*" (Ofwat's Overview, paragraph 2.5); and (ii) a 2019 Citizens Advice report argued that water customers had been overcharged over the previous fifteen years, partly because Ofwat had estimated costs and risks to investors to be higher than they actually were.

²⁷ Exhibit 009, CMA, Report: Bristol Water plc: A reference under section 12(3)(a) of the Water Industry Act 1991, 6 October 2015, paragraph 3.4.

²⁸ The Competition Commission (CC) took the view that the number of consumers who are likely to be affected by a system failure is a relevant factor in determining whether Ofwat has met the necessary standard for resilience, demonstrating the interplay between the resilience and consumer duties. See Exhibit 010, Report: Bristol Water plc: A reference under section 12(3)(a) of the Water Industry Act 1991, 4 August 2010, paragraph 3.112.

February 2020,²⁹ the resilience duty is a primary duty that should underpin the exercise of all of Ofwat's functions.

46. Under s.2(2A)(c) WIA91, Ofwat is under a duty to ensure that YWS is able to finance the proper carrying out of its functions (the *financing duty*). There are two limbs to the established interpretation of this primary duty:
- (a) the first is that a notionally efficient firm (the *efficient firm*) should be able to earn profits in line with those that arise in a competitive market (in this context expressed as a return on capital, i.e. the Weighted Average Cost of Capital or *WACC*); and
 - (b) the second is that the efficient firm's cash flows should be consistent with it being able to raise finance on reasonable terms, e.g. to maintain an investment grade credit rating.³⁰
47. Failure to meet at least one of these limbs would mean that the efficient firm is not 'financeable'.
48. As regards the first limb, the expected return (profit) is a function of both (i) the WACC and (ii) the efficient firm's performance against regulatory cost allowances and other performance incentives. Hence the notionally efficient firm would not be expected to earn profits in line with those that arise in a competitive market if:
- (a) Ofwat sets targets for cost allowances and/or outcomes beyond those an efficient firm would be expected to deliver³¹, so that the expected return would be below the WACC; and
 - (b) Ofwat sets the WACC itself below the appropriate level.
49. In practice, because one of the roles of equity is to bear risk, the impact of Ofwat making either of these errors would fall firstly on equity investors, resulting in their expected returns being below the level required for the company to be investable for equity going forward. In this sense the first limb is said to concern whether the efficient firm is 'investable'.
50. In Ofwat's Cross-Cutting Issues Paper, Ofwat states that "*taking account of these revenue and cost allowances, we assess whether our determinations provide adequate cash flows and debt capacity for efficient companies to be able to finance their functions and this forms the basis of the financeability assessment that we carry out in making our final determinations.*" Thus,

²⁹ Exhibit 011, Transcript of the 25 February 2020 Teach-in, page 25, lines 8-9: "*The resilience enhancement programme is all discretionary investment.*"; page 26, line 14: "*we have to have a high bar for resilience; and this is all discretionary*".

³⁰ This description accords with Ofwat's explanation to the CMA at the 11 February 2020 Teach-in: see Exhibit 012, Transcript of the 11 February 2020 Teach-in, page 7, lines 9-16.

³¹ A particular example of this is where an efficient firm has been funded to meet, and met, its historical performance targets but these targets are then significantly increased. This is the position that YWS finds itself in in relation to Ofwat's PR19 leakage targets, which will be addressed further later in this Statement.

Ofwat appears to have failed to have due regard to the first limb of the financeability duty i.e. as to whether the efficient firm is “investable”. This is a highly material omission, the significance of which is addressed at 260 et seq. below.

51. In addition, these errors may also weaken cash flows, such that key credit metrics may fall below the levels required to maintain investment grade status for the purpose of raising debt finance (see paragraph 236 et seq. below regarding the downgraded credit ratings of certain companies that have accepted their respective final determinations). Thus, failing to meet the first limb of the financeability duty can result in a failure to meet the second limb.
52. Should either of these situations arise:
 - (a) the *financing duty* would be breached;³² and
 - (b) as it would result in underinvestment (i.e. investment being below its efficient level e.g. as a result of moving away from the economically optimal programme of investments) and/or increased borrowing costs, consumers would be harmed in the long-term, in breach of the *consumer duty*. Hence, the financing duty is, itself, intrinsically connected to protecting the interests of YWS’s customers in the long term.
53. Under s.2(3)(a) WIA91, Ofwat is under a *secondary duty* to promote economy and efficiency on the part of water companies. In the discharge of this duty, Ofwat is subject to the usual public law considerations for decision-makers, including taking account only of relevant considerations adequately evidenced, and acting consistently and rationally.
54. Under s.2(4) WIA91, in exercising its powers Ofwat must have regard to the principles of best regulatory practice, which include the principles that regulatory activities should be consistent and targeted only at cases in which action is needed.³³ This is reflected in Ofwat’s statements about how it regulates the sector, such as “*We focus on what matters, taking proportionate and targeted action where needed, using all of our tools to align interests – and encourage the sector to focus on building strong relationships with their customers and others.*”³⁴
55. As will be explained in the following sections of this Statement, one of YWS’s key concerns with the FD is that in an effort to address the perceived shortcomings in previous price controls by focusing on reduction in customer bills, Ofwat has not found the right balance between short-term price cuts on

³² The CC has previously acknowledged that restricting a water company’s allowed returns to a level below the cost of capital would breach the financing duty. See Exhibit 010, Report: Bristol Water plc: A reference under section 12(3)(a) of the Water Industry Act 1991, 4 August 2010, paragraph 9.2.

³³ These principles are set out in section 2(4) of the WIA91.

³⁴ See Ofwat’s website under the heading “Our principles of economic regulation”: <https://www.ofwat.gov.uk/business-plan-how-we-regulate/>, last accessed 1 April 2020.

the one hand and the capital expenditure needed to ensure long-term resilience and sustainability on the other. In other words, Ofwat appears to have elevated its secondary duty to promote economy and efficiency above its primary duty to customers, to the maintenance of the resilience of YWS's infrastructure and to the financeability of YWS's operations.

56. YWS categorically refutes the suggestion that it considers "*customers should pay more and receive less*".³⁵ On the contrary YWS wants to create a long-term, sustainable, resilient and efficient business that delivers the lowest bills possible for customers, and believes that the FD will undermine those objectives.
57. Before turning to the detail of YWS's concerns with the FD, the following paragraphs set the scene by addressing Ofwat's approach to PR19, and how YWS responded to this in its Business Plan.

³⁵ Exhibit 002, Ofwat's Overview, paragraph 1.7.

D. Ofwat's Approach to PR19

58. This section provides some necessary context to assist in understanding YWS's concerns with the FD. It first sets out the 'building blocks' that make up price control determinations, before explaining the way in which Ofwat seeks to use these building blocks to create an efficiency challenge for water companies 'in the round'. It then explains Ofwat's stated policy and goals for PR19, which YWS followed when developing its Business Plan. YWS's concerns with the way in which Ofwat attempted to achieve those goals via its efficiency-challenge mechanism are addressed in Section F below.

Ofwat's Final Methodology

59. As Ofwat has explained to the CMA,³⁶ there are three main building blocks of its PR19 price control determination. Whilst this is common ground between YWS and Ofwat, the building blocks are restated here in summary for convenience:
- (a) **Costs assessment:** Cost assessment is a fundamental element of regulatory efficiency assessments.³⁷ Ofwat sets what it considers to be an efficient cost allowance for each of base and enhancement expenditure. Base costs are routine costs that companies incur to provide a base level of service to their customers; enhancement costs are those required to enhance the capacity or quality of the service beyond the base level.
 - (b) **Outcomes:** Ofwat sets the level of the outcome targets for certain performance measures (***Performance Commitments***), together with a package of incentives or penalties in relation thereto (ODIs). An ODI for a given Performance Commitment will: (a) recompense YWS's customers if YWS fails to meet the relevant target (underperformance); and (b) reward YWS if it surpasses that target (outperformance).
 - (c) **Risk and Return:** Ofwat sets the allowed WACC with a view to ensuring that water companies can finance their activities and sets other financial penalties/incentives such as the gearing outperformance mechanism introduced in PR19, PAYG and run-off rates.³⁸
60. Ofwat's Final Methodology at PR19 is significantly more complex than at prior price controls, either within the water sector or other regulated industries. For example, Ofwat determined six separate price controls in PR19 in

³⁶ See Exhibit 013, Transcript of the 4 February 2020 Ofwat Teach-in.

³⁷ Ofwat has focussed on an outcomes-based approach since PR14: "*Our new outcomes-based approach will give companies flexibility to deliver outcomes at lowest cost and to focus resources on what local consumers most value – by asking companies to propose key outcome commitments rather than detailing hundreds of outputs.*" See Exhibit 014, Ofwat, Setting price controls for 2015-20 – final methodology and expectations for companies' business plans, page 170.

³⁸ PAYG is the proportion of Totex that is recovered in each year of the price review period and run-off rates refer to the revenue allowance to reflect the annual depreciation of the RCV. This reflects the long-term nature of the benefit to customers of previous company investment in its assets.

comparison with two in PR14. One of YWS's concerns with Ofwat's approach at PR19 is that it did not take account of this increased complexity when considering the cash flows that the notionally efficient firm would be expected to achieve and the uncertainty around these. This is described in more detail in paragraphs 130 to 134 of this Statement.

61. The figure below illustrates the complexity of PR19 in comparison to previous price controls and provides a summary of how the elements of Ofwat's PR19 building blocks impact cashflows:

No. of price controls	Regulatory incentive mechanisms
<p>At PR14, separate wholesale and retail controls were established. Now Six separate price controls apply at PR19:</p> <ul style="list-style-type: none"> Water network plus Water resources Wastewater network plus Bioresources Residential retail Business retail <p>As recently as PR09, there was only a single price control per company.</p>	<p>PR19 includes a complex mix of incentives that impact cash flows:</p> <ul style="list-style-type: none"> ODI performance (large number of complex incentives – a typical WaSC has around 40 ODIs) Retail and developer services incentives Numerous other incentives in water resources and network + <p>At PR09, there were just two main incentives (excluding cost efficiency).</p>
Cost assessment / efficiency	Financing costs
<p>Cashflows impacted by:</p> <ul style="list-style-type: none"> Outturn performance vs Ofwat allowance Ofwat cost sharing mechanism Variance between forecasts & reality <p>Approach to cost assessment:</p> <ul style="list-style-type: none"> Large number of benchmarking models used (20 for base in FDs) Mix of historical and forecast cost approaches used <p>At PR09 < 10 models used, based on historical data only.</p>	<p>Cashflows impacted by:</p> <ul style="list-style-type: none"> Actual cost of debt incurred Performance of index used by Ofwat New high gearing outperformance sharing mechanism PAYG / RCV run off levers Transition from RPI to CPI <p>At PR09, companies were exposed to actual cost of debt risk, but the remainder of the above have all been introduced since then.</p>

Table 5: illustration of complex 'web' of mechanisms which influence cash flows at PR19. Source: Annex 1, Economic Insight, Financeability of the notionally efficient firm: a bottom-up analysis, Figure 8.

62. It is also common ground that the choices Ofwat makes in respect of the three main building blocks of its price control together combine to create an overall

level of regulatory challenge “*in the round*”.³⁹ However, given that this goes to the heart of YWS’s concern with the FD, it is convenient to recapitulate the interplay of these building blocks here.

63. Ofwat determined **allowed costs** by considering:
- (a) base costs (which include growth costs⁴⁰) using either benchmarking assessment via econometric models or bespoke assessment methods; and
 - (b) enhancement costs using benchmarking assessment or a ‘deep/shallow dive’ assessment for particular projects.
64. Once the relevant efficient costs were established by one of these methods, Ofwat then determined an efficiency challenge to represent the potential for catch-up.⁴¹ Ofwat then also overlaid a frontier-shift⁴² efficiency challenge and factored in its view on real price effects (*RPEs*). The latter were intended to account for changes in input costs other than those over and above general inflation (as measured by CPI at PR19).⁴³
65. In effect, the efficiency challenge meant that Ofwat reduced the modelled or assessed cost allowance by a certain proportion, so that (in simplified terms) the relevant water company had to spend its cost allowance more efficiently to deliver the related services. Accordingly, it is critical that these efficiency measures were properly calibrated.
66. As regards **outcomes**, Ofwat set Performance Commitments in respect of certain performance measures on an industry-wide basis and others on a case-by-case basis for each water company. In doing so it considers what level of

³⁹ Exhibit 012, Transcript of the 11 February 2020 Ofwat Teach-in, page 11, lines 8-18.

⁴⁰ ‘Growth costs’ are those incurred as a result of housing growth. In previous price review determinations Ofwat included growth costs in enhancement costs. It took this approach at the IAP stage of PR19 but then moved them to base costs in the DD, and retained the latter approach in the FD (though with different modelling). The effects of this on YWS are addressed at paragraph 195(c) below.

⁴¹ ‘Catch-up’ inefficiency refers to the fact that, because water companies are not operating in a competitive market, they are not compelled, through competitive forces, to be efficient. As such, they may be operating ‘behind’ the efficiency frontier (either carrying higher costs and/or delivering worse outcomes performance than would arise in a competitive market).

⁴² The ‘frontier shift’ element of efficiency relates to gains that even ‘relatively efficient’ firms can make (i.e. and so would also arise in a competitive market). This is typically characterised as representing ongoing productivity-driven efficiency, relating to improvements in technology, which ‘push outwards’ the combinations of costs and outcomes that can be delivered by firms. This is consistent with Ofwat’s definition at PR19, whereby the regulator describes frontier shift as follows: “*Over time we expect the productivity of companies to improve as they adopt new technologies or new ways of working. These productivity improvements shift the efficiency frontier for the sector.*” Exhibit 008, Ofwat, PR19 final determinations: Securing cost efficiency technical appendix, page 115.

⁴³ Ofwat has factored in RPEs in all previous price review determinations. Accounting for RPEs is consistent with the approach of other regulators.

‘stretch’ was appropriate (i.e. how much improvement it required the relevant water company to make relative to its current level of performance).

67. Ofwat chose to set the Performance Commitment stretch interdependently of its cost assessment.⁴⁴ Consequently, the stretch Ofwat set on outcomes was an additional efficiency or productivity challenge over and above that applied on costs. Therefore, the totality of the efficiency challenge set was a function of the targets Ofwat set for both costs and outcomes. Compared to PR14, the Performance Commitments in PR19 were considerably more demanding, and the scale and scope of ODIs were much greater, with more revenue at risk during the period.
68. For example, at PR14 the return on regulatory equity (**RoRE**) range for ODIs was estimated as +0.4%/-1.2%, compared to Ofwat’s estimate of +2.95%/-2.46% at PR19. Notwithstanding the flaws identified with Ofwat’s approach to assessing risk at PR19, this still indicates a considerable increase in the range of revenue associated with ODIs. Similarly, the scope of Performance Commitments has increased, with Ofwat introducing 14 comparative measures, compared to four at PR14. As Ofwat’s performance expectations are based on a future looking upper quartile level at PR19, compared to the historical upper quartile targets set at PR14, the improvements are therefore also more demanding.
69. Ofwat concluded that “*there is a positive correlation between our estimates of historical cost efficiency and outcome performance*”⁴⁵ to justify its position that stretching efficiency and performance targets could be delivered by the industry. However, Ofwat attributed as much weight to this proposition for service levels where there is in fact no such correlation (such as leakage and pollution), or where the correlation is weak (such as internal sewer flooding), as it did where the correlation is strong (interruptions to supply). Ofwat’s own evidence would have warranted a further investigation on its part to examine the factors (geophysical or otherwise), such as the identification of the large number of cellared properties in Yorkshire, that would have improved the correlation. Instead, it imposed blanket and equally stretching Performance Commitments across the board with strong ODIs for failure, notwithstanding the evidential weakness of its position. This issue and its consequences are addressed further in paragraphs 152 to 187 below.
70. In addition to the efficiency challenges relating to costs and outcomes, there is a third component of the overall ‘regulatory challenge’, which relates to WACC. Setting the WACC too low means that allowed revenues will be lower than they should be, financial headroom will be reduced, and the company will face downside skew in risk, so that on an overall basis the company is less able to deliver for its customers and achieve the Performance Commitment

⁴⁴ As will be addressed later in this Statement, Ofwat considers that improvements in performance should not incur additional cost. While YWS agrees that management action can drive improvements to a limited extent, where Ofwat is seeking transformational changes in performance targets, relating in particular to underground assets, this position is difficult to sustain.

⁴⁵ Exhibit 003, Ofwat’s Cross-Cutting Issues Paper, Appendix A1: Overall Stretch appendix.

targets it has been set. This issue and its consequences are further addressed in paragraphs 217 to 243 below.

Ofwat's 'step change' policy

71. As stated in Ofwat's Overview, Ofwat set out a number of key policy themes central to the process. Great customer service, affordable bills, resilience in the round and innovation, all featured heavily in Ofwat's Final Methodology and framed the price review expectations. Ofwat also made clear from the outset of PR19 that it was seeking to introduce a 'step change' in efficiency in the water industry, with evident focus on reducing customer bills. In other words, Ofwat was looking to introduce a level of efficiency challenge in PR19 that went far beyond those it had set in prior price control determinations.
72. YWS supported Ofwat's policy themes as they aligned closely with the feedback from YWS's customer engagement and the company's own views.⁴⁶ Accordingly, YWS developed its Business Plan with these principles in mind. Although affordable bills were clearly a primary consideration, YWS believed that the resultant customer bills should be an output of robust business planning and regulatory assessment, rather than a foregone conclusion or a predefined input. Similarly, YWS was also, as an acknowledged efficient firm, entitled to expect that any efficiency and performance challenges imposed by Ofwat would recognise YWS's starting point on efficiency, would be the result of well evidenced analysis, would be realistic and achievable within AMP7 and would be balanced against Ofwat's other key themes for PR19 and its other statutory duties such as resilience and sustainability. For the reasons set out in Section G below, that was not the case in the FD.
73. With Ofwat's objectives in mind, YWS, informed by a comprehensive understanding of its customers' needs and lifestyles, set out to create a Business Plan in the best interests of its customers and the environment in the long-term. YWS included in its plan the necessary adaptations for dealing with the profound challenges faced by the water sector, as recognised by Ofwat, namely climate change, population growth, and shifting customer expectations⁴⁷, while at the same time ensuring that the plan did not present financeability risks.

⁴⁶ For example, see Exhibit 001, YWS, PR19 Business Plan, page 11, which states that its "*5 Big Goals also align with Ofwat's key themes for PR19; delivering great customer service, using innovation, making sure bills are affordable and our company is resilient.*"

⁴⁷ Exhibit 002, Ofwat's Overview, paragraph 1.1.

E. YWS's Business Planning

74. This section outlines the rigorous process that YWS adopted to create its Business Plan for PR19 in accordance with Ofwat's Final Methodology. Ofwat has explained the timetable and planning process overall, which is not repeated here. All relevant documents have been submitted to the CMA.
75. Out of necessity, the various aspects that contributed to YWS's Business Plan are set out below in linear order. However, it is important to emphasise that the process of creating the Business Plan was iterative, with each element informing the other as the Business Plan developed.

Customer engagement

76. At the 4 February 2020 Ofwat Teach-in, Ofwat explained to the CMA that:

*"The objective of the outcomes framework is to encourage companies to focus on delivering what customers want. Therefore, a key element of that is the customer engagement."*⁴⁸

77. Indeed, Ofwat had indicated that it did not intend to make detailed interventions in company ODI packages as it had done in PR14.⁴⁹
78. Rather, Ofwat's overall approach and Final Methodology for PR19 required YWS to engage directly with its customers and use the information obtained from them to drive decision making and the development of its Business Plan, setting its own ODI package.⁵⁰ The stated goal was to mimic a competitive market by incentivising water companies to understand and respond to the requirements of their customers.⁵¹ In accordance with its consumer duty, one of Ofwat's guiding principles was that water companies should deliver outcomes that their customers (and society) value, at a price they are willing to pay.⁵²
79. Ofwat expressly recognised the key role that water companies had to play in this process:

"Companies are best placed to understand and respond to their customers' needs and requirements ... This is why we do not want to

⁴⁸ Exhibit 013, Transcript of the 4 February 2020 Ofwat Teach-in, page 37, lines 17-20.

⁴⁹ See, for example, Exhibit 015, Reflections on the price review – learning from PR14, Ofwat (July 2015).

⁵⁰ Exhibit 016, Ofwat's customer engagement policy statement and expectations for PR19, 25 May 2016, pages 6 and 12.

⁵¹ Ibid. At the 4 February 2020 Teach-in Ofwat stated that "we are trying to mimic what would happen in a competitive market" (Exhibit 013, Transcript of the 4 February 2020 Ofwat Teach-in, page 36, lines 21-22).

⁵² Exhibit 017, Ofwat PR19 Final Methodology, page 25.

*place ourselves – or any other third party – directly between them and their customers.”*⁵³

80. In addition to conventional stated preference willingness to pay (*WTP*) surveys, Ofwat encouraged companies to use more innovative customer engagement approaches, such as revealed preference surveys and use of insights from behavioural economics, together with evidence obtained through day-to-day contact with customers.⁵⁴ Ofwat highlighted the need for companies to triangulate the findings of customer feedback against other data sources and research available to them, thereby recognising that the companies themselves were best placed to carry out such analysis.⁵⁵ Ofwat also recognised that feedback from well-designed engagement procedures can be representative of the views of the wider customer base.⁵⁶ This necessitated engagement with hard-to-reach and vulnerable customers.⁵⁷ Ofwat emphasised the need to inform customers of performance levels relative to other water companies.⁵⁸
81. YWS’s customer engagement process for PR19 met all of the above-mentioned requirements.⁵⁹ Indeed, Ofwat acknowledged the high quality of YWS’s customer valuation work at the IAP stage:

*“The company provides convincing evidence of the effective use of a wide range of customer engagement techniques including more innovative approaches such as behavioural experimental methods. It provides evidence of its high quality approach to implementing customer valuation techniques including the use of behavioural economics techniques. It provides mostly convincing evidence of its engagement with its customers on both the business plan and on longer-term issues.”*⁶⁰

82. Moreover, the Yorkshire Forum for Water Customers (the **Forum**)⁶¹ stated in its PR19 Assurance Report to Ofwat that the “*level of innovation and the*

⁵³ Exhibit 016, Ofwat’s customer engagement policy statement and expectations for PR19, 25 May 2016, page 10.

⁵⁴ Ibid page 14.

⁵⁵ Ibid page 16.

⁵⁶ Ibid page 18.

⁵⁷ Ibid page 19.

⁵⁸ Ibid page 21.

⁵⁹ See e.g. Exhibit 018, YWS Board Assurance Statement, pages 19-21: “*The Board’s plan has been founded upon continuous, comprehensive, robust, high quality customer and stakeholder engagement. The Board is satisfied with the high levels of customer engagement. The engagement has adopted an innovative programme of face to face and online community activity to ensure that the outcomes, performance commitments and incentives meet the expectations of customers and stakeholders. The results of the engagement and the priorities of customers, regulators and stakeholders are at the heart of the plan.*”

⁶⁰ Exhibit 019, PR19 initial assessment of plans: Yorkshire Water company categorisation, January 2019, page 4.

⁶¹ The Forum is an independent group of customer and stakeholder representatives. In PR19 Ofwat asked the Forum to provide independent challenge to YWS and assurance to Ofwat in relation to: the

extent and reach of the customer research programme is commendable and has meant that Yorkshire Water now has an expanded depth of understanding about its customers to shape its services around their preferences.”⁶²

83. With the help of its consultant AECOM, YWS designed and undertook a multipronged approach to customer valuation, which involved stated⁶³ and revealed preference⁶⁴ surveys, together with innovative techniques such as behavioural experiments.⁶⁵ YWS specifically ensured that its customers were made aware its performance levels relative to other water companies.⁶⁶ The results of these various approaches were rigorously triangulated to value the marginal benefits to YWS’s customers of service improvements.⁶⁷ These quantitative results were cross checked against more qualitative surveys that tested the relative importance of the various performance measures to YWS’s customers, and their views on YWS’s performance relative to other water companies. The views of vulnerable⁶⁸ and hard-to-reach groups were obtained and YWS more generally ensured that the sample groups responding to each

quality of YWS’s customer engagement; and the extent to which the results of this engagement were driving YWS’s decision making and reflected in its Business Plan.

⁶² Exhibit 020, Yorkshire Forum for Water Customers, PR19 Assurance Report, 3 September 2018, page 3.

⁶³ See brief summary in Exhibit 021, Appendix 5a – Customer and Stakeholder engagement, section 6.3.1, pages 37-8; Exhibit 022, Appendix 5e – Understanding Customer Values, Stated Preference Report, Method detailed at pages 0-1, Results detailed at pages 2-5; Exhibit 023, Appendix 5f – Understanding Customer Values_ Stated Preference Severity Report, Method detailed at page 1, Results detailed at pages 2-5.

⁶⁴ See Exhibit 021, Appendix 5a – Customer and Stakeholder engagement, sections 6.3.2, 6.3.3, page 38; for e.g. river water quality, see Exhibit 024, Appendix 5g – Understanding Customer Values Revealed Preference River Water Quality Report.

⁶⁵ See Exhibit 021, Appendix 5a – Customer and Stakeholder engagement, section 6.3.4, page 39; for a detailed methodology and analysis, see Exhibit 025, Appendix 5i – Understanding Customer Values, Behavioural Experiment Report, e.g. page 2 ‘The behavioural experiment took the form of an interactive online tool, which allowed participants to adjust service levels and observe, in real time, the effects that this has on their bill.’ See also the trust experiment, Exhibit 026, Appendix 5j – Understanding Customer Values, Trust Experiment Report, esp. Appendix 2, section 2.4 ‘Findings’, for analysis of the variables which affect customer trust and relations with YWS.

⁶⁶ See e.g. Exhibit 022, Appendix 5e – Understanding Customer Values, Stated Preference Report, show cards presented to customers to contextualise their responses, which include graphics showing YWS’s relative performance within the water industry, replicated at pages 14-16.

⁶⁷ See Exhibit 027, Appendix 5d – Understanding Customer Values_ Data Triangulation Report.

⁶⁸ See e.g. Exhibit 025, Appendix 5i – Understanding Customer Values_ Behavioural Experiment Report. Table 3 on p. 10; for a breakdown of results to the behaviour experiment, including by vulnerability characteristics, see *ibid*, pages 27-30; for results for particular vulnerable groups, see *ibid*, pages 41-3. For refinement of YWS’s approach to assessing the views of people in vulnerable categories, see e.g. Exhibit 028, Appendix 5c – Table of Forum engagement activity challenges, page 16 (the two comments raised regarding Questions 15 and 20, which show querying of the metrics used for identifying ‘vulnerable’ and YWS taking action to improve its metrics).

survey reflected the demographic make-up of its wider customer base.⁶⁹ YWS's customer engagement process was peer-reviewed by experts from Cranfield University and collaborators from international water companies,⁷⁰ and customer valuation was scrutinised by an independent customer challenge group to ensure that customers' views were fairly reflected in the Business Plan.⁷¹

84. At the end of this process, YWS had a clear picture of the value that its customers ascribed to service improvements with respect to key performance measures, which it could then use to inform the construction of its Business Plan. In particular, customer willingness to pay evaluation was used to derive the values for the 'Six Capitals' framework described at paragraph 86(d) below. YWS was therefore surprised and disappointed when Ofwat decided to change its approach to reliance on customer feedback and to disregard its previous recognition of regional differences arising as a result. These issues are further addressed in Section G.

The DMF process

85. YWS's ultimate goal in the preparation of the Business Plan was to balance the needs of all of its stakeholders in answering the following questions:
 - (a) What should YWS's Performance Commitment targets be during AMP7 and what ODI package should accompany them?
 - (b) What profile of efficient Totex does YWS require during AMP7 both to deliver services to its customers meeting those targets and to fulfil its overriding statutory obligations?
86. To help YWS balance these potentially conflicting drivers it developed a Decision Making Framework (**DMF**) – a set of processes, governance and training supported by a new software tool. In summary, the DMF was used as follows:
 - (a) YWS populated the DMF with data relating to business risks and opportunities over the next 25 years. This data was drawn from a variety of sources, such as asset deterioration models, detailed investigations or confirmed statutory obligations from YWS's quality regulators.
 - (b) The data fed into the DMF included information from YWS's 'unit cost database'. This contains the data on the costs of schemes delivered efficiently over the prior 15 years e.g. through the use of YWS's framework partners, as acknowledged by Ofwat (see paragraph 26

⁶⁹ A stated aim e.g. of Exhibit 022, Appendix 5e – Understanding Customer Values_ Stated Preference Report, page 0; factors outlined at *ibid*, pages 24-27; see factoring at page 52 (“*We have explored the variation in household WTP against the following classifications of factors*”) and tables on following pages.

⁷⁰ Exhibit 001, YWS, PR19 Business Plan, page 97.

⁷¹ *Ibid*, page 34.

above). All of YWS's procurement and solutions-related costs in the DMF are underpinned by this. This data was supplemented by consultant work where appropriate, e.g. in relation to the cost of delivering the certain projects in Hull to tackle the threat of flooding (these projects are addressed in detail at paragraph 307 et seq. below). YWS also conducts econometric modelling to assess its performance relative to other water companies.

- (c) For each business risk and opportunity, YWS identified one or more mitigation options. Drawing on historical efficient cost data obtained from completed repairs and upgrades to its assets, YWS determined the cost of the various potential solutions. For example, the solutions to a mains failure could variously be to replace the pipe, refurbish it, repair it, or do nothing.
- (d) YWS ascribed to each movement in service level (i.e. the impact of a solution) a monetised value (benefit) based on its impact on YWS's '**Six Capitals**' metrics (financial, manufactured, human, natural, intellectual and social). This value was obtained from a combination of YWS's customer feedback and other industry recognised valuations to enable wider benefits to be captured. The Six Capitals framework is emerging as best practice for assessing decisions, such as those required in PR19.
- (e) The cost and benefit values allowed YWS to calculate the net benefit of each intervention. This net benefit calculation reflected industry best practice and has been welcomed by Ofwat.⁷²
- (f) The DMF helped YWS to decide the most beneficial way to address a particular risk and the optimal combination of solutions to maximise benefits at a portfolio level. Thus, the DMF calculates the costs necessary to maximise value both to YWS's customers and in relation to wider considerations. In this sense the output of the DMF informs the cost of delivering what YWS's customers want and what is most beneficial to the environment.

87. The DMF output 'portfolio'⁷³ was adjusted iteratively to inform the construction of the Business Plan, accounting for feedback (customer, regulatory and environmental) received as part of the wider engagement and assurance process. YWS did this by constraining whole, or parts of the programme under a variety of scenarios. For example:

⁷² Exhibit 029, Ofwat: YWS Final Determination, page 27 section 2.3: "*YW's business plan does provide high quality evidence of how the company identifies and assesses risks to resilience, including taking a systems-based approach to risk assessment. It also demonstrates good evidence of embedding natural capital approaches to its resilience framework.*"

⁷³ The DMF itself is the framework by which YWS makes decisions – and all of the systems, processes etc. that go alongside it. The portfolio is the part of this to which YWS asks the investment-related questions, i.e. the most beneficial way to spend its money. The output of the portfolio is a list of investments that meet the constraints that it is set – i.e. a programme.

- (a) ensuring that there is sufficient investment to meet YWS's statutory obligations;
 - (b) constraining Totex to reflect affordability, but ensuring that YWS does not take on unacceptable risk in delivering on its Performance Commitments; and
 - (c) allowing for challenging, but realistic future efficiency gains.
88. Through this leading approach to the evaluation of Six Capitals and their application in optimising YWS's investment portfolio, YWS estimated that its customers would receive a return benefit of £3.90 for every £1 it invested in delivering services.⁷⁴

Cost Efficiency Challenge

89. As noted at paragraph 72 above, in creating its Business Plan YWS was mindful of Ofwat's intention to impose a step change in efficiency challenge in PR19. In an effort to meet this regulatory challenge, the final Totex submitted in the Business Plan amounted to in excess of £800m reduction in costs as compared to what the same programme would have cost in AMP6. The efficiency target was derived from econometric analysis of current costs, along with forecasts of future costs to determine where the upper quartile level would be. This analysis was reviewed by the Board and used as a target for future efficiency in AMP7.
90. This of course represented a significant cost-efficiency challenge which, when combined with the stretching Performance Commitment targets in its Business Plan (which are addressed below), was by no means guaranteed to be met. However, YWS felt that it was achievable in view of: (a) productivity efficiency gained through investment that it had made in AMP6 to prepare for the need to hit UQ performance levels on certain Performance Commitments in AMP7 (as discussed at paragraph 139 et seq. below); and (b) capital efficiency gained through a new asset management operating model. This included new commercial frameworks and enhanced direct delivery, and an in-house strategic planning partner to help drive efficiencies in the Totex value chain earlier in YWS's programme development.⁷⁵
91. Part of the purpose of the upfront cost efficiency challenge was to give YWS the capacity in its programme to meet the new service levels indicated in Ofwat's Final Methodology without placing undue pressure on customers' bills. YWS was on track to meet the regulatory targets set in PR14, but the distance to travel between the successful delivery of its PR14 targets and the new upper quartile expectations for PR19 was significant.

⁷⁴ This is an aggregate figure from the numbers in the Business Plan; see Exhibit 001, YWS PR19 Business Plan, pages 116 for water network plus; 140 for wastewater network plus; 173 for water resources; 183 for bioresources.

⁷⁵ This is described in detail in Exhibit 001, YWS PR19 Business Plan, chapters 10 and 11.

92. YWS has always striven to respond to regulatory expectations and targets, so it began improvements in key areas such as internal sewer flooding and leakage in AMP6, going beyond the targets set in PR14, funded through outperformance, with customer and shareholder support.
93. This ‘early start’ allowed YWS to understand the practical difficulties and costs of making significant service improvements, and also to have a clear understanding of possible productivity gains. The upfront efficiency gains described here allowed costs to maintain these service improvements to be included in the Business Plan to improve service in key areas without creating significant bill increases.
94. As a specific example of how YWS responded to the efficiency challenge in PR19, YWS’s Business Plan described how its own benchmarking had identified it as being comparatively inefficient in the area of bioresources. The challenges to the existing business were highlighted by the 2015 Boxing Day floods, which took 50% of the company’s sludge treatment capacity out of service, causing the company to rely on third parties to provide emergency treatment capacity, dramatically increasing costs. As a result, YWS’s Business Plan described how it intended to transform its bioresources business to deliver a 23% reduction in the associated costs. In this connection, YWS has created a separate bioresources business with autonomy to deliver what is now a ringfenced service to customers, at a lower cost. It has undertaken a comprehensive market testing exercise, identifying significant savings that can be delivered through market delivered solutions. These actions contribute significantly towards keeping customers’ bills low.

Performance Commitments

95. As part of its Business Plan YWS committed to achieving targets in relation to certain Performance Commitments. These were developed iteratively alongside the Totex programme, reflecting service levels commensurate with statutory obligations, customers’ service priorities, Ofwat’s Final Methodology and forecast efficient costs.
96. Starting from the Performance Commitments already in place for 2015-20, YWS re-examined service priorities with its customers to understand whether those commitments were still relevant, or whether new commitments needed to be incorporated. Alongside the direct customer research and engagement, YWS also engaged with the Forum, as key representatives for commercial and domestic customers and the environment, to ensure that the proposed Performance Commitments met expectations and had the appropriate balance and coverage across the Business Plan.
97. Having identified the package of Performance Commitments, YWS set targets for those Performance Commitments following Ofwat’s Final Methodology. The approach recognised that not all Performance Commitment targets could be set in the same way, so targets were variously set with regard to the following factors: cost-benefit analysis; comparative information, including forecast industry quartile service levels; historical information; minimum improvement levels; maximum level attainable; and expert knowledge. Some

Performance Commitment targets were set in conjunction with the Totex from YWS's Business Plan, whilst others were developed following Ofwat's Final Methodology and the latest available information. For the **comparable Performance Commitments**⁷⁶, YWS identified where additional expenditure would be required to achieve the UQ performance levels required by Ofwat (see paragraph 139 below).

98. Despite complying with Ofwat's regulatory direction, YWS did not agree that setting UQ performance levels for the comparable Performance Commitments was appropriate and raised these concerns with Ofwat at the time.⁷⁷ Moreover, YWS did not anticipate that Ofwat would not allow the efficient costs necessary to reach these performance levels. These concerns are explained in more detail in paragraph 135 et seq. below.
99. The process described above ensured that YWS's Performance Commitment targets delivered what its customers wanted, and represented the best view of what an efficient firm would be expected to achieve. The Performance Commitment targets included industry-leading levels of improvement in key service areas, and significant improvement in a large number of other areas. The targets reflected Ofwat's Final Methodology in relation to the comparable and common Performance Commitments.

Outcome Delivery Incentives

100. As discussed at paragraph 76 et seq. above, YWS undertook a comprehensive and innovative programme of customer engagement to inform the development of Performance Commitments and ODIs, ensuring it met all Ofwat's methodological criteria. This resulted in a package of 43 ODIs, (of which 29 are financial and 14 are reputational). Of these, 36 are crystallised during AMP7.
101. YWS also proposed a suite of ODIs to accompany its Performance Commitment targets, again following Ofwat's Final Methodology. Ofwat's prescribed approach was as follows, where the letter 'p' denotes the assumed Totex sharing rate of 50%:⁷⁸

$$ODI_{\text{underperformance}} = \text{incremental benefit} - (\text{incremental cost} \times p)$$

$$ODI_{\text{outperformance}} = \text{incremental benefit} \times (1 - p)$$

⁷⁶ This term is used in this statement to denote the "common comparable level Performance Commitments", i.e. internal sewer flooding, pollution incidents, water supply interruptions and leakage, rather than the "comparable bespoke Performance Commitments", i.e. carbon/operational carbon, priority services awareness, gap sites, voids verification, drinking water contacts, low pressure and external sewer flooding. See the explanation of these and the non-comparable common and bespoke Performance Commitments at Annex 5, Economic Insight report, Ofwat's approach to ODI interventions in the FD, page 6.

⁷⁷ Exhibit 030, YWS response to Ofwat PR19 Methodology consultation.

⁷⁸ The Totex sharing mechanism is a means by which YWS can recover a proportion of any overspend against the relevant regulatory allowance from its customers. A 50% rate means that YWS can recover 50% of the relevant overspend.

102. For the majority of cases, YWS used the customer valuations evidence derived from its rigorous customer engagement process to inform the ‘incremental benefits’ element of the ODI formulae. By doing so, YWS ensured that if it underperformed on a Performance Commitment, it would recompense customers by the value of the loss of service as those customers had assessed it to be (equal to the benefit value for customers, adjusted for the cost sharing rate). Equally, if YWS were to outperform the Performance Commitment, YWS would earn a reward equal to half the benefit value to its customers as those customers had assessed it to be. The approach ensured that the performance levels and incentives in YWS’s Business Plan were set at the most economically efficient level (i.e. set at the point where marginal cost equals marginal benefit) and aligned with the cost-benefit analysis for the investment plan.⁷⁹
103. For the remaining cases, YWS proposed financial ODIs⁸⁰ based on cost estimates or direct market prices where the use of customer valuations would not be feasible or appropriate. Customer valuations are not possible in all cases, particularly where a direct service impact is not experienced by customers. For example, asset health performance measures concern the underlying condition of the network, rather than a service impact for customers.

Additional customer engagement

104. YWS also undertook substantial customer research to ensure that the Performance Commitment targets and ODIs proposed in the Business Plan aligned with customers’ expectations.⁸¹ In addition to the valuation exercises, YWS also carried out research into its customers’ priorities for Performance Commitments, customers’ preferences for the types of solutions to investment needs, customers’ understanding of the Performance Commitments, and customers’ support for the number and type of financial ODIs.⁸² Customer insights were also gained from ongoing research into customer satisfaction, segmentation and contact with YWS.⁸³

Calibrating the ODI incentive package

105. Ofwat’s Final Methodology required water companies to calibrate their ODI packages within an overall risk range, defined in terms of the ‘revenue impact’ of out- and under-performance payments on the RoRE. As such, YWS undertook Monte Carlo risk modelling⁸⁴ of its ODI package as a whole, to

⁷⁹ As a result of setting Performance Commitments in this way, YWS also ensured the targets reflected its best view of what an efficient firm would be expected to achieve.

⁸⁰ The other type of ODI is reputational – for these, YWS is required to make a public declaration about its performance against the relevant PC.

⁸¹ Exhibit 001, YWS, PR19 Business Plan, pages 31-36.

⁸² Ibid, pages 119-138.

⁸³ Ibid, appendix 18b Lifestyle Research.

⁸⁴ ‘Monte Carlo risk modelling’ is a method of modelling the risk profile of processes that have multiple possible outcomes. In simplified terms it works as follows: (a) decide upon a reasonable

ensure the resultant RoRE risk range was in line with Ofwat's guidance (thus fairly balancing investor and customer risk).⁸⁵

106. More generally, YWS carefully assessed the potential upside and downside of its Business Plan overall, across all the regulatory incentives, to ensure that it faced a balanced risk profile overall, as required for an efficient firm.

Assurance of the Business Plan

107. To satisfy itself that the PR19 Business Plan was accurate, high quality and accessible, YWS subjected all elements of the plan, including supporting data, to a robust assurance process. In summary, this assurance process:
- (a) followed the 'three levels of assurance' framework, which is implemented across all regulatory reporting and programmes and is best practice;
 - (b) was risk based, meaning there was greater focus on areas of high risk within its Business Plan;
 - (c) included audit checks and challenges by data providers, data managers, senior managers, directors and independent auditors and assurers;
 - (d) covered the preparation, production and publication of the data that underpins the Business Plan to confirm the plan was built on high quality data; and
 - (e) ensured that findings from processes were fully reviewed and actions to address any concerns raised were implemented.
108. YWS's Board Audit Committee received and challenged the findings from the assurance reviews. The Board received assurance that the Business Plan implemented the strategy and direction set by the Board. Full-day strategy workshops were held with the Board to review and challenge the information contained within the Business Plan to ensure that it met the expectations of YWS's customers and all other stakeholders, as well as addressing the long-term challenges of climate change, population growth, resilience and affordability.
109. YWS also conducted acceptability testing of the Business Plan with its customers, receiving an approval rate of 86%.⁸⁶

range of values for each of the inputs to the process; (b) use a computer to select 'randomly' a value of each of the inputs within the given range; and (c) using the selected value for each of the inputs, calculate the corresponding values of the outcomes. Repeating these steps several times allows one to predict the relative likelihood of each of the possible outcomes.

⁸⁵ See Exhibit 031, YWS PR19 Business Plan, Appendix 13a – RoRE risk analysis, page 23 et seq.; Exhibit 032, YWS PR19 Business Plan, Appendix 13b – ODI RoRE risk analysis: a report for Yorkshire Water; Exhibit 017, Ofwat PR19 Final Methodology, page 60: "*We are suggesting an indicative range for the size of companies' ODI outperformance and underperformance payments of $\pm 1\%$ to $\pm 3\%$ of RoRE at PR19.*"

Conclusion

110. In designing its Business Plan, YWS focused on delivering what its customers wanted, a consideration that was given ultimate prominence in Ofwat's Final Methodology. YWS engaged extensively and effectively with its customers to understand their preferences, which were incorporated into the Business Plan alongside other considerations from the Final Methodology. YWS effectively balanced the needs of all stakeholders against efficient costs, applied a significant cost efficiency challenge to those outputs, and created a challenging Performance Commitment/ODIs package (including a 25% reduction in leakage⁸⁷ and a 41% reduction in internal sewer flooding) that reflected customer preferences. The final package presented an £800m reduction in costs as compared to what the same programme would have cost in AMP6. YWS then carried out a rigorous and multi-layered assurance process to ensure the Business Plan was deliverable. YWS's Business Plan was designed precisely "*so that customers will get more of what really matters to them.*"⁸⁸

⁸⁶ Exhibit 001, YWS, PR19 Business Plan, page 242: "*Our customer acceptability testing shows that 86% of our customers are supportive of our plan.*"

⁸⁷ This was reduced following the IAP stage – see paragraph 163 et seq.

⁸⁸ Exhibit 017, Ofwat PR19 Final Methodology, page 3.

F. Ofwat's Interventions

111. Ofwat's DD proposed a large number of material changes to the position set out in YWS's Business Plan which were unacceptable to YWS. On top of the £800m of efficiency savings that YWS had already included in its Business Plan, the DDs asked for a further approximately £800m reduction in Totex.
112. However, in an attempt to avoid a redetermination and focus on delivering for its customers, YWS sought to reach a compromise with Ofwat by proposing a number of alterations to its Business Plan. The effect of these proposals was to make the significant efficiency challenge that YWS had set itself even harder to meet with a far higher delivery risk. The compromise proposals were, however, made on the basis that Ofwat accept the entire package of YWS's proposals, which included a number of measures intended to mitigate the effect of the DD on YWS, such as the introduction of glidepaths, and caps and collars on ODIs.⁸⁹ There was no room for YWS to concede any further ground – as doing so would have entailed too much risk – which YWS made clear to Ofwat in its DD Representations.
113. Ofwat did not accept the compromise proposals in YWS's DD Representations, and the FD, while less stretching than the DD, represented a package that YWS could not accept. The key differences between YWS's Business Plan and Ofwat's FD are summarised below.

Disallowed Costs

114. Table 6 below summarises the expenditure requested by YWS for retail services in its Business Plan and the corresponding allowances in Ofwat's FD.

Price Control	YW FBP Sep 18 £m	OFWAT FD £m	Gap £m
Residential Retail (at outturn prices)	258	322	64

Table 6: Overall level of retail interventions

115. It should be noted that at the IAP stage, YWS made an adjustment after further analysis of revenue which increased the proposed expenditure in the retail control, giving a final required expenditure of £273m. This figure was retained by YWS in all subsequent submissions to Ofwat. In delivering its FD, Ofwat provided a frontier efficiency allowance of £322m.
116. Table 7 below shows similar summary information for wholesale expenditure. The overall adjustments are provided in both gross and net representations. The table shows that the wholesale interventions at the FD resulted in a total reduction of around **£865m** against YWS's Business Plan.

⁸⁹ See Exhibit 018, YWS DD Representation, Board Assurance Statement.

Price Control	YW FBP Sep 18 £m	OFWAT FD £m	Gap £m
Water Resource	226.4	214.7	-11.7
Water Network Plus	1,855.3	1506.9	-348.4
Wholesale: Water Total	2081.7	1721.6	-360.1
Wastewater Network Plus	2,568.6	2138.6	-430.0
Bioresource	380.3	305.4	-74.9
Wholesale Wastewater Total	2,948.9	2,444.0	-504.8
Wholesale Total (gross)	5,030.5	4,165.6	-864.9
Gs & Cs	112.1	112.4	+0.3
Wholesale Total (net)	4,918.4	4,053.2	-865.2

Table 7: Overall level of wholesale interventions

117. Given the additional level of complexity associated with wholesale, Table 8 below presents a more granular breakdown of the wholesale interventions in the FD, together with adjustments made by YWS in its DD Representations (i) in response to evidence presented by Ofwat and in light of feedback on the business plans of the other water companies and (ii) as part of YWS's effort to reach a compromise position. The table is followed by a brief narrative to provide context.⁹⁰

Area	Gap between FBP and FD £m	Adjustment timing	Adjustment source
Leakage Cost Reduction	131.0	IAP Response	YWS
Bioresources Cost Adjustment Claim (removal)	24.8	YWS's DD Representations	YWS
Other cost removals/YW adjustments throughout the process	42.3	Final position at YWS's DD Representations	YWS
Total YWS adjustments	198.1		
WINEP	168.9	Final position at FD ⁹¹	Ofwat
Botex Modelling adjustments	77.2	Final position at FD	Ofwat

⁹⁰ The detailed cost gaps in Table 8 are the result of YWS's analysis of Ofwat's FD. YWS's focus has been on understanding the root causes of the gaps and how they align to the areas of Ofwat intervention and the tools/evidence that Ofwat used. Some of the elements therefore cover more than one price control. The thinking and assumptions required to break down the gaps may differ to those made by Ofwat, so values may not align with Ofwat's submission. The wholesale Totex gap is however consistent with YWS's submitted costs and with Tables 3.1 and 3.2 of YWS's FD, pages 31 and 32 respectively.

⁹¹ Interventions were made by Ofwat at IAP, DD and FD stages. This figure represents the final position at FD.

Area	Gap between FBP and FD £m	Adjustment timing	Adjustment source
Growth	34.7	FD	Ofwat
Business Rates (exc. Frontier shift included in Botex modelling)	34.3	Final position at FD	Ofwat
TMA (exc. Frontier shift included in Botex modelling)	21.6	Final position at FD	Ofwat
Other Enhancement Investment	17.7	Final position at FD	Ofwat
Resilience (Hull)	12.2	Final position at FD	Ofwat
Total Ofwat adjustments	366.6		
YWS's DD Representation compromise offer – tolerating absence of UQ costs	300.5	YWS's DD Representations	YWS
Total adjustments	865.2		

Table 8: Further breakdown of wholesale adjustments by the time of the FD.

118. The first group of adjustments related to actions YWS took after the submission of its Business Plan in recognition of the challenges Ofwat had set for the industry as a whole, and the specific measures Ofwat had taken in response to YWS's Business Plan:

- (a) **Leakage cost reduction:** In response to Ofwat's decision not to provide specific funding for leakage, YWS decided not to progress some of its higher cost, longer-term initiatives. This reduced YWS's overall unit costs, allowing it to adjust its required expenditure accordingly and deliver broadly stable bills in its IAP response.
- (b) **Bioresource CAC:** This adjustment arose from YWS's decision to accept the overall Ofwat assessment of the cost adjustment claim, where it considered that YWS could find the required new sludge capacity due to the phosphorus programme through the bioresources market.
- (c) **Other cost removals/YWS adjustments throughout the process:** This reflects a number of adjustments made by YWS between its submitted Business Plan and YWS's DD Representations. These adjustments were made in response to Ofwat feedback in relation to required efficiency improvements and the proven need (or in Ofwat's view, the lack thereof) for investment. The adjustments included the removal of £20m wastewater treatment works growth costs following a further review of requirements, removal of £10m associated with the catch-up efficiency challenge, and the removal of £6m enhancement costs in bioresources.

119. Taken together these adjustments by YWS amounted to £198.1m.

120. The second group of adjustments in the table were made by Ofwat during the price review process, with the final position representing the expenditure gap at FD:

- (a) **WINEP:** Of the total £169m gap, £113m relates to phosphorous removal. This reduction in expenditure has implications for process choices across a number of sites. As detailed further in paragraph 301 et seq., YWS is now planning to use chemical dosing at more sites than it had planned, rather than its preferred and more sustainable approach of Biological Nutrient Removal (**BNR**). The remaining £56m relates to modelling output differences associated with a number of other WINEP drivers, key examples of which include storage schemes (£22m), investigations (£10.8m), flow monitoring at sewage treatment works (£6.8m) and storage schemes at sewage treatment works (£4.5m).
- (b) **Botex model adjustments:** Ofwat's decision to rely on underspecified models, as explained in more detail in Section G, resulted in significant variance from YWS's Business Plan. The resulting output:
 - (i) does not adequately account for key variables such as service quality or complexity of treatment;
 - (ii) is based on a stringent ad hoc efficiency benchmark with minimal recognition of model error and with no evidential basis;
 - (iii) applies a large upwardly biased frontier shift challenge based on an overstated estimate of scope; and
 - (iv) makes no allowance for changes in non-labour input prices.

These deficiencies, which are detailed further at paragraph 188 et seq. and supported by work undertaken by Oxera (included in Annex 8), account for the majority of the £77m gap.

- (c) **Growth:** Ofwat made an adjustment at FD to its modelled cost allowance to account for differences in forecast population growth between the historical period and AMP7. YWS based its population growth data in its Business Plan on third party provided, granular forecast data. In contrast, Ofwat used the less granular ONS population growth forecast data. In YWS's view the former, more precise data takes greater account of regionally specific circumstances. This adjustment resulted in downward adjustments to both wholesale water (£11m) and wastewater (£24m).
- (d) **Business rates:** Ofwat disallowed £34.3m associated with business rates based on its modelling. This gap is mostly associated with business rates expenditure, where Ofwat's modelling underestimated the asset base on which business rates are applied and ignored the impact of asset revaluations. A further £7.4m reduction (on top of the £34.3m) is attributable to the application of a frontier shift challenge –

this amount is included in the overall Botex modelling gap outlined above.

- (e) **TMA:** YWS's Traffic Management Act (*TMA*) forecast expenditure largely comprises costs incurred as a result of permit conditions and administering the permit schemes. Detailed evidence of the composition of these costs was provided in YWS's DD Representations.⁹² This highlighted that significant elements of the costs are determined by local councils, and not by YWS. In YWS's view these costs are not adequately covered in the modelled allowance and give rise to the identified £21.6m gap. As with business rates, a frontier shift challenge has also been applied, leading to a further £0.6m gap, which is also included in the above Botex modelling gap.
 - (f) **Other enhancement investment:** Ofwat applied a cost challenge to other enhancement drivers not related to WINEP. The main impact of this was a reduction in the drinking water quality programme where £15m (c. 20%) of the costs were removed.
 - (g) **Resilience (Hull):** As detailed at paragraph 307 et seq. below, YWS requested £28.7m to fund the Hull flood resilience scheme,⁹³ assuming that the remaining £21.3m would be achieved through partnership funding. However, Ofwat allowed only £16.4m in the FD and further classified the expenditure as base maintenance (i.e. to be funded from 'business as usual' sewer flooding work) rather than as additional funding in recognition of its core purpose as a resilience improvement measure.
121. Taken together the above interventions account for an expenditure gap at FD of £366.6m.
122. The final 'adjustment' in the table shows YWS's effort to reach a compromise with Ofwat at the DD Representations stage. In particular, YWS offered to tolerate the disallowance of enhancement expenditure for UQ service delivery in relation to the comparable Performance Commitments (this underfunding is addressed in paragraph 158 et seq. below). It is important to note that whilst YWS decided to tolerate the absence of costs, it did not and still does not agree with Ofwat's policy. Moreover, YWS's offer was conditional on Ofwat accepting the totality of YWS's position as proposed in its DD Representations, which in summary meant closing the costs gap and adjusting the Performance Commitment package to create a more balanced set of service improvements and incentives. While Ofwat made some adjustments in the FD, these were not sufficient to address YWS's Board's concerns. Ofwat's interventions are addressed further in paragraph 152 et seq. below.

⁹² Exhibit 033, YWS DD Representation Cost Efficiency, pages 56-62.

⁹³ See Exhibit 001, YWS PR19 Business Plan, page 145.

Interventions in the Performance Commitment/ODI Package

123. Ofwat also materially changed YWS's Performance Commitment/ODI package. As set out in Annex 5, Ofwat intervened in 19 of YWS's 27 Performance Commitments that had financial incentives.⁹⁴ This includes intervening in all ten of YWS's common Performance Commitments that had financial incentives.
124. The figure below shows Ofwat interventions (or not) in relation to each of the 27 Performance Commitments; Performance Commitment levels; standard incentive rates; enhanced incentives; and caps, collars and deadbands. A red highlighted '1' denotes an intervention, and a grey highlighted 'NA' denotes where Ofwat's Final Methodology did not allow for a Performance Commitment to have an enhanced incentive. As can be seen, Ofwat intervened extensively across the different categories of parameters – particularly in terms of common and comparable bespoke Performance Commitments, which are listed first.

	PC levels	Standard incentive rates	Enhanced incentive rates	Caps, collars and deadbands
Internal sewer flooding	1			1
Pollution incidents	1	1		1
Water supply interruptions	1	1	1	1
Leakage	1	1	1	1
Drinking water quality			NA	1
Mains repairs	1	1	NA	
Per capita consumption	1	1	1	1
Treatment works compliance	1	1	NA	1
Sewer collapses	1	1	NA	
Unplanned outage	1	1	NA	1
Carbon/ Operational carbon	1	1	NA	1
Priority services awareness		1	NA	
Gap sites		1	NA	
Voids verification	1	1	NA	1
Drinking water contacts	1	1	NA	1
Low pressure			NA	
External sewer flooding	1	1	NA	1
Working with others		1	NA	
Land conserved and enhanced			NA	
Length of river improved	1		NA	1
Education			NA	
Water recycling			NA	
Repairing or replacing customer owned pipes			NA	
Surface water management			NA	
Quality agricultural products			NA	
Bathing water quality			NA	1
Significant water supply events			NA	

Table 9: Ofwat interventions in YWS's Performance Commitment/ODI package. Source: Annex 5.

125. Not only did Ofwat intervene in many of YWS's proposed financial Performance Commitments, but where it did intervene, the change was often

⁹⁴ The 27 Performance Commitments include those that YWS proposed a financial incentive for, or that Ofwat added a financial incentive to through its determinations.

YWS includes both interventions that Ofwat made at the FD and interventions it made at the DD that YWS did not challenge in its DD Representations for the sake of compromise (as discussed in paragraph 112 above).

‘large’ – for example, more than doubling or halving incentive rates. Furthermore, the interventions were asymmetric in that they increased downside risk more than they increased upside risk.

126. The way in which Ofwat intervened, and the reasons it gave for doing so, varied across the different Performance Commitments and ODI parameters. For example, for internal sewer flooding and pollution incidents, Ofwat intervened to set YWS’s Performance Commitment targets at Ofwat’s forecast UQ. For many common and comparable Performance Commitments, Ofwat intervened in standard incentive rates to make them more similar to industry averages. Ofwat’s interventions are addressed further in paragraph 152 et seq. below.

G. The flaws in the FD

127. As explained at paragraph 71 et seq. above, one of Ofwat's goals in PR19 was to impose a regulatory challenge on water companies that would represent a 'step change' relative to prior price control determinations. In trying to achieve this goal, however, Ofwat has imposed a regulatory challenge that is beyond what an efficient firm could be expected to achieve. In view of the anticipated consequences for YWS had it accepted the FD (which will be addressed in Section H below), this means that Ofwat did not find the right balance between the short-term desire to reduce bills on the one hand and the capital investment needed to ensure long-term resilience and sustainability on the other.
128. YWS agrees that increasing performance and reducing costs to customers is a desirable long-term outcome. However, regulatory action designed to achieve this must have regard to what is achievable by an efficient firm during the price control period in question.
129. That an efficient firm could not be expected to meet Ofwat's regulatory challenge is the result of a number of interconnected issues with the FD, which concern all three of Ofwat's building blocks. The remainder of this section is structured as follows:
- (a) **Paragraphs 130 to 134:** Ofwat's 'step change' in efficiency challenge at PR19 has resulted in an overall cost and outcomes efficiency challenge beyond what could be achieved by the notionally efficient firm.
 - (b) **Paragraphs 135 to 151:** Ofwat's approach to setting cost and outcomes targets has created a disconnect between the two.
 - (c) **Paragraph 152 to 187:** Ofwat has made numerous interventions in YWS's ODI package, making arbitrary and unjustified changes to many of the individual parameters, replacing the views of YWS's customers with Ofwat's own view, and not reflecting the genuine differences between YWS and the rest of the industry.
 - (d) **Paragraphs 188 to 215:** Ofwat's cost modelling fails to distinguish inefficiency from other factors, includes inappropriate catch-up efficiency benchmarks, applies a flawed frontier-shift efficiency challenge, and does not take account of all relevant real price effects.
 - (e) **Paragraphs 216 to 281:** Ofwat's has (a) set the WACC too low; (b) failed to ensure that the notionally efficient firm can raise finance on reasonable terms; (c) failed to ensure that the notionally efficient firm is investable; and (d) failed correctly to calibrate key incentives such that the notionally efficient firm would be expected to earn the allowed return; and (e) introduced an inappropriate gearing outperformance sharing mechanism.
 - (f) **Paragraph 282:** Ofwat has created a disconnect between risk and return.

Ofwat has misidentified the notionally efficient firm

130. As explained in paragraph 46, Ofwat's financing duty has historically been interpreted with respect to a 'notionally efficient firm'. The intuition for this is that economic regulation is intended to incentivise the outcomes that would arise in a competitive market.⁹⁵ Therefore, under this logic, water customers should not 'pay' for any 'inefficiency' of regulated companies. On this interpretation, Ofwat is not compelled to ensure the 'actual' firms it regulates are financeable; but, rather, that a hypothetically efficient firm would be.⁹⁶
131. Following from the above, and as also explained in paragraph 48, Ofwat's financing duty requires that it sets a determination that reflects what a 'notionally efficient' firm would be expected to achieve. Should Ofwat fail to do this (i.e. overall set a determination that is 'too challenging', because the various targets and incentives it has set do not reflect the expected performance of an efficient firm) said firm will not, by definition, be financeable.⁹⁷ As is also explained in paragraph 52 above, a failure to fulfil this duty would imply a failure to fulfil the consumer duty, given the obvious customer harm that would then arise. In light of this, the 'identification' of the notionally efficient firm (i.e. setting an appropriate overall level of challenge) is crucial to ensuring the PR19 determinations are appropriate and consistent with Ofwat's duties.⁹⁸

⁹⁵ Exhibit 013, Transcript of the 4 February 2020 Ofwat Teach-in, page 26, lines 21-22: "*we are trying to mimic what would happen in a competitive market*".

⁹⁶ See Annex 6, Economic Insight, report: Top-down analysis of the financeability of the notionally efficient firm: a follow-on report for Anglian Water; Northumbrian Water; and Yorkshire Water, pages 5-7, especially footnote 2, citing Exhibit 034, Economic Insight report, Financeability of the notionally efficient firm: top down analysis, August 2019. Available here: <https://www.anglianwater.co.uk/siteassets/household/about-us/9b-financeability-of-the-notionally-efficient-firm-top-down-analysis-final-stc-28-08-19.pdf>.

⁹⁷ Annex 6, Economic Insight, report: Top-down analysis of the financeability of the notionally efficient firm: a follow-on report for Anglian Water; Northumbrian Water; and Yorkshire Water, page 8: "*the key findings from our first report remain – and hence the notionally efficient firm is likely not financeable*"; Annex 1, Economic Insight, report: Financeability of the notionally efficient firm: a bottom-up analysis, page 23.

⁹⁸ Despite Ofwat's statements to the CMA regarding "*the impact of what* [The National Infrastructure Commission] call "*information asymmetry*" – *so information held by companies that is not held by the regulator – and that tended to result in a bias of returns in favour of companies and their investors*" (Exhibit 013, Transcript of the 4 February 2020 Ofwat Teach-in, page 9, lines 9-12), YWS's view is that there is no information asymmetry in this process. Firstly, Ofwat received a great deal of comparative information submitted by all of the water companies as part of the annual reporting processes, as well as the extensive business plans. Ofwat arguably has better comparative information than the companies themselves do. Secondly, the companies do not have perfect information. Business plan forecasts require projections for up to eight or even 23 years ahead, so the data is often accompanied by considerable uncertainty. Where the regulator introduces new metrics or changes definitions of existing metrics, the companies may not have comparable historic information either.

132. To put the overall level of challenge YWS faces at PR19 into context, the ‘difference’ between the bill profile YWS proposed in its Business Plan and that in Ofwat’s FD (a measure of ‘challenge’ Ofwat has used historically) is 3.7 times greater than the average level of challenge over the PR04-PR14 price controls.⁹⁹ Critically, even this measure of challenge is an understatement, because it omits the considerable stretch on outcomes set by Ofwat. For example, on the ‘pollution incidents’ ODI, YWS is tasked with achieving a rate of improvement that is 2.7 times greater than at PR14.¹⁰⁰
133. The considerable increase in overall challenge at PR19 is consistent with Ofwat’s stated view that now is the time for a ‘step change’ from the water industry. Ofwat has indicated that it believes such a step change can be supported on the grounds of (i) companies being able to make a material ‘step’ in the amount of efficiency gains they can achieve (both relating to costs and outcomes);¹⁰¹ and (ii) by historical outperformance.¹⁰² However, Ofwat’s arguments as to the availability of productivity gains in the sector based on national statistics and historical outperformance at PR14 are unsustainable as paragraph 199 below and Annex 9 demonstrate. The position is then compounded by errors as to the calculation of key aspects of the price control as summarised in paragraph 129 and referred to in more detail below. The consequence is that the efficient firm will not be financeable on Ofwat’s FD.
134. The hard evidential support for YWS’s position is further consistent with a number of intuitive points YWS should like to draw to the CMA’s attention. Briefly, these are as follows: (a) the FD is predicated on the assumption that differences between companies relate only to efficiency, and that despite there being transformational changes in some metrics, costs to improve are already reflected in base allowances;¹⁰³ (b) Ofwat does not appear to have recognised that setting ‘too hard’ a challenge causes consumer and environmental harm,

YWS has noted asymmetry in the quality of evidence underpinning Ofwat’s decisions. For example, the late changes to both targets and incentive rates made at the IAP stage and again in the DD undermined the economic logic of the ODI framework as articulated by Ofwat, moving away from the original optimised alignment of marginal costs and value to customers. These interventions were not justified by any supporting evidence or consideration of potential detrimental effects or unintended consequences.

⁹⁹ Annex 6, Economic Insight, report: Top-down analysis of the financeability of the notionally efficient firm: a follow-on report for Anglian Water; Northumbrian Water; and Yorkshire Water, Figure 3, page 24.

¹⁰⁰ Ibid, page 25.

¹⁰¹ Exhibit 017, Ofwat PR19 Final Methodology, pages 5, 14, 135: “*We expect companies to make a step change in cost efficiency providing scope for lower bills and help with affordability.*”

¹⁰² Ibid, pages 147-148 “*Our view of efficiency will be informed by our comparative assessment. We will use historical and forward-looking cost performance to identify the most efficient companies in the sector, which will set the benchmark for the rest of the companies.*”

¹⁰³ Annex 1, Economic Insight report: Financeability of the notionally efficient firm: a bottom-up analysis, page 23; Annex 6, Economic Insight, report: Top-down analysis of the financeability of the notionally efficient firm: a follow-on report for Anglian Water; Northumbrian Water; and Yorkshire Water, pages 25-26; Exhibit 035, Ofwat: PR19 FDs: Policy summary, page 14.

particularly in the long-run;¹⁰⁴ and (c) Ofwat does not appear to have ‘challenged’ or ‘stress tested’ its own views, or thought carefully about the uncertainty inherent in the key building blocks of PR19.¹⁰⁵ In short, Ofwat did not hold itself to the same high evidential standard that it set for YWS.

Ofwat’s approach creates a disconnect between costs and outcomes¹⁰⁶

135. This section addresses the fact that Ofwat’s approach to two of its main building blocks – costs and outcomes – has created a disconnect between the two.
136. Ofwat made clear in its statements to the CMA during the 4 February 2020 Teach-in that it recognises the necessary connection between investment needed to achieve improved performance (on regionally specific issues) and higher bills to customers:

*“The company with the highest bills, South West Water, had to do a lot of investment immediately post-privatisation on cleaning up its beaches.”*¹⁰⁷

*“Obviously, post-inflation, bills have gone up but are still around 45 per cent higher than they were at privatisation. That really reflects the huge amount of investment that has gone into the sector, which is shown on the next graph.”*¹⁰⁸

137. Despite this, Ofwat has adopted the position that improvements in YWS’s service levels must be achieved without allowing YWS any additional expenditure to do so.¹⁰⁹ In other words, Ofwat has assumed that service improvements can be achieved purely through efficiency savings.¹¹⁰
138. The following sections describe Ofwat’s failure to account for the interaction between Performance Commitments and costs, for both comparable and other performance areas. An important example of this in the FD relates to the comparable Performance Commitments, which are addressed first below (the targets of which, as set out in YWS’s Business Plan, would require £300m of additional expenditure to achieve). Examples of other Performance Commitments targets where improvement is required without funding are then considered.

¹⁰⁴ Annex 4, Economic Insight report: Ofwat’s approach to funding upper quartile performance, pages 2-3.

¹⁰⁵ Annex 4, Economic Insight report: Ofwat’s approach to funding upper quartile performance, page 4.

¹⁰⁶ Oxera has conducted a detailed analysis of Ofwat’s approach to costs and outcomes, which is provided at Annex 8, Oxera report: Integrating cost and outcomes.

¹⁰⁷ Exhibit 013, Transcript of the 4 February 2020 Ofwat Teach-in, page 21, line 25 and page 22, line 1.

¹⁰⁸ Ibid, page 28 lines 10-12.

¹⁰⁹ Exhibit 003, Ofwat’s Cross-Cutting Issues Paper, paragraphs 3.50-3.53.

¹¹⁰ Annex 4, Economic Insight report: Ofwat’s approach to funding upper quartile performance.

Ofwat's flawed approach to UQ performance on comparable Performance Commitments

139. In PR19 Ofwat required water companies to reach UQ performance levels in relation to the following comparable Performance Commitments: supply interruptions, pollution incidents and internal sewer flooding. In simplified terms, UQ performance means achieving the performance level that the top 25% of firms expect to meet or exceed in AMP7. Ofwat also required water companies to reduce leakage by 15%.
140. Ofwat's position is that the cost of achieving these targets can be met by Ofwat's allowed base costs.¹¹¹ However, three features of Ofwat's Final Methodology mean that this is highly unlikely to be the case:
- (a) Firstly, Ofwat made the decision to set these targets before it could have known both what the UQ forecasts would be and what its cost allowances would be.¹¹²
 - (b) Secondly, Ofwat's costs models do not include controls for outcomes performance levels. The first implication is that its cost models cannot be used to forecast what it would cost YWS (or the industry) to achieve UQ performance levels in AMP7. The second implication is that its cost models could significantly under- or over-state the historical relative efficiency of different companies.¹¹³
 - (c) Thirdly, Ofwat's Final Methodology returns any scope for productivity gains to customers in the form of lower prices via a 1.1% frontier-shift challenge. The implication is that companies do not have the option of instead investing productivity gains in improved performance.¹¹⁴ To assume otherwise, while also increasing Performance Commitment levels, as Ofwat has done in the FD, effectively double-counts the scope for productivity gains.¹¹⁵ Moreover, in any event, YWS considers that Ofwat has materially overstated the scope for productivity gains.¹¹⁶ Ofwat's suggestion that the targets could

¹¹¹ Ofwat did not make this known to water companies until the IAP stage of PR19.

¹¹² Annex 4, Economic Insight report: Ofwat's approach to funding upper quartile performance, page 2.

¹¹³ Annex 8, Oxera report: Integrating cost and outcomes, pages 1, 2; Annex 9, Oxera report: Issues with Ofwat's frontier shift assessment in PR19, pages 1, 2; for modelling taking account of uncertainty when using historic data to make forecasts, see Annex 10, Oxera report: Issues with Ofwat's approach to determining the cost benchmark, pages 6-7.

¹¹⁴ Annex 9, Oxera report: Issues with Ofwat's frontier shift assessment in PR19, pages 1-2; Annex 4, Economic Insight report: Ofwat's approach to funding upper quartile performance, page 9.

¹¹⁵ In simplified terms, reducing allowed costs to reflect productivity gains and asking YWS to perform at the same level would require it to find efficiencies equivalent to the estimated productivity to bridge the gap, but reducing allowed costs and asking YWS to perform at a higher level requires it to achieve higher productivity than Ofwat considers to be achievable.

¹¹⁶ Annex 9, Oxera report: Issues with Ofwat's frontier shift assessment in PR19.

legitimately have been even higher has no merit. This topic is further addressed at paragraph 199 et seq. below.¹¹⁷

141. As regards paragraph 140(b) above, attached at Annex 8 is a paper from Oxera, which shows that Ofwat's econometric cost models do not take into account service quality as a possible factor accounting for variations in costs between companies. It is well established in the scientific literature that the omission of key factors such as service quality from such models will bias the efficiency scores that those models produce. Any further inferences based on those outputs are thus compromised. Accordingly, having omitted service quality from its econometric models, Ofwat has no basis to infer from those models that its efficiency challenge (in terms of costs and outcomes) is achievable; nor that the catch-up efficiency numbers that it derives from these models are correct.¹¹⁸ Moreover, even if the theoretical inadequacy of Ofwat's analysis is overlooked, the subsequent evidence that it presented to justify its conclusion is inadequate and misleading. The further ramifications (and material effects) of this omission are addressed in paragraph 190 et seq. below.
142. Ofwat presented new material with the FD to rebut the suggestion that its earlier work had created a disconnect between costs and outcomes. Ofwat's later position is however indefensible because it variously:
- (a) relies upon a backward-looking assessment of performance at PR14, where the allowed costs and Performance Commitments in AMP6 were obviously different to those in PR19;¹¹⁹ and
 - (b) as regards leakage, Ofwat relies upon econometric models using an implausibly low estimate for the additional cost to an efficient company of meeting Ofwat's stretching leakage Performance Commitment.¹²⁰
143. Ofwat's position is further undermined by the fact that, on the available evidence, the benchmark company that Ofwat has used to set the wastewater cost allowance (Northumbrian Water) has not historically achieved target performance on pollution incidents and internal sewer flooding at the respective target levels Ofwat has set for YWS on those measures.¹²¹ Moreover, the benchmark company Ofwat has used for water cost allowances (South West Water) has not historically achieved performance supply

¹¹⁷ Annex 9, Oxera report: Issues with Ofwat's frontier shift assessment in PR19, section 1.3.

¹¹⁸ Exhibit 036, Ofwat PR19 FD, Appendix: Overall level of stretch across costs, outcomes and allowed return on capital appendix, page 3 – these are 4.6% for wholesale water 2% wholesale wastewater 15.4% retail.

¹¹⁹ Annex 4, Economic Insight report: Ofwat's approach to funding upper quartile performance, pages 1, 3-4.

¹²⁰ Annex 4, Economic Insight report: Ofwat's approach to funding upper quartile performance, pages 4-8; Exhibit 051, YWS, IAP response document, page 11.

¹²¹ Annex 4, Economic Insight report: Ofwat's approach to funding upper quartile performance, page 7. See also Annex 10, Oxera report: Issues with Ofwat's approach to determining the cost benchmark, which quantifies the lack of confidence in Ofwat's models.

interruptions at the target level it has set for YWS on that measure.¹²² If the benchmark company (i.e. the most efficient company according to Ofwat's cost models) has not achieved the level required of YWS within the benchmark's cost allowances, then it must follow that other water companies (including YWS) could not do so within their base cost allowances.¹²³

144. Ofwat's contention that efficient companies can improve performance without additional funding by technological advances is irrelevant in the circumstances.¹²⁴ As noted above, this is because Ofwat had already included a 1.1% per annum deduction in base cost allowance for frontier-shift efficiency savings, which represented an efficiency challenge that can only be met e.g. via technological advances.¹²⁵ YWS does not therefore have the option of investing any cost savings obtained from such advances in improved performance.
145. Finally, Ofwat's argument that the fact that some companies have accepted their respective FDs implies that the targets for the comparable Performance Commitments can be met out of base cost allowances is obviously a non sequitur:¹²⁶
- (a) water companies may have chosen to accept the FD and yet still not expect to achieve the targets, on the basis that they have accepted the FD 'in the round' and also accounted for the direct and indirect costs of a redetermination by the CMA;
 - (b) there may be regional, operational and financial differences between companies which mean the targets can be achieved without funding for some but not others; and
 - (c) companies may decide to divert resources from elsewhere to meet the targets.
146. As mentioned in paragraph 136, Ofwat appeared to accept in principle that costs and outcomes should be connected and had, in fact, sought to suggest that they were in practice connected in the FD. For example, Ofwat attempted

¹²² The available data also shows that the average historical performance of the companies at least as efficient as South West Water (in Ofwat's cost models) in relation to leakage is worse than YWS's target for PR19.

¹²³ It is notable that Ofwat's approach to this issue is at odds with that of Ofgem. Ofgem adjusted the cost of gas distribution networks that failed to meet the service obligations through a penalty (GD1). Ofgem also adjusted the cost benchmark of electricity distribution companies that were offering different service levels (ED1).

¹²⁴ Exhibit 036, Ofwat PR19 final determinations: Overall level of stretch across costs, outcomes and allowed return on capital appendix, page 7.

¹²⁵ Ofwat's assertion that there was higher scope for productivity allowance in Ofwat's Overview (for which, see Exhibit 008, Ofwat, PR19 final determinations: Securing cost efficiency technical appendix, page 167) has no merit, as explained in Annex 9, Oxera report: Issues with Ofwat's frontier shift assessment in PR19.

¹²⁶ This is further explained in Annex 4, Economic Insight report: Ofwat's approach to funding upper quartile performance, page 9.

to account for service performance in relation to leakage in certain of its ‘alternative’ FD cost models.¹²⁷ Its analysis showed, however, that the models gave substantially different answers in relation to companies’ cost performance if this measure was included. Despite the challenges associated with properly accounting for costs and outcomes together in an econometric context, Ofwat considered the problem to be sufficiently material as to increase another water company’s cost allowance by £50m.¹²⁸

147. However, leakage is only one of numerous performance measures that Ofwat could have accounted for in its cost models. The analysis by Oxera contained in Annex 8 shows that the results of the cost modelling are highly sensitive to which performance measures are included. For example, incorporating leakage and water quality contacts into the cost models could lead to a material increase in YWS’s cost allowance. This analysis illustrates that in not sufficiently controlling for outcomes in its cost models, Ofwat has materially underfunded YWS to meet its stretching performance targets.
148. The failure to properly account for the interaction between costs and performance is further intensified by the significant flaws within each of the individual cost modelling and performance components. This is explained in more detail in Oxera’s paper at Annex 8.

Simultaneous improvement of cost efficiency and outcomes performance

149. Firms at the efficiency frontier cannot simultaneously improve costs and outcomes performance (i.e. ‘do more for less’). That is to say, they face trade-offs that mean they can only ‘move along’ the frontier of what is achievable, with differing mixes of outputs and costs.
150. This has the following self-evident implications:
 - (a) When a regulator sets a catch-up cost efficiency challenge, benchmarking the industry to its best view of the efficiency frontier,¹²⁹ it is by definition also benchmarking the industry to a point at which outcomes cannot be improved beyond those delivered by that cost-efficient benchmark. Thus, the expected and funded level of outcomes performance is the level of performance achieved by that cost efficiency benchmark (and vice versa).
 - (b) Therefore, analyses of whether individual firms have, in practice, delivered improvements in both costs and against individual outcome measures (such as those cited by Ofwat) are wholly irrelevant. That is to say, any individual firm, which may not be perfectly efficient, may make efficiency gains that might materialise either through cost savings or outcomes performance, or some combination thereof simultaneously. That does not, however, change the fact that when

¹²⁷ For the concession, see Exhibit 035, Ofwat: PR19 FDs: Policy summary, page 14.

¹²⁸ Annex 8, Oxera report: Integrating cost and outcomes, section 2.4.

¹²⁹ As this cannot be perfectly observed, in practice regulators proxy it. In Ofwat’s case, they did this by taking the 3rd or 4th ranked firms on cost efficiency.

setting a forward-looking benchmark at PR19, one must recognise the essential point that efficient firms do face trade-offs. A failure to do so would clearly result in setting an unachievable overall efficiency challenge.

YWS recognises that an efficient firm may simultaneously improve cost efficiency and outcomes performance via productivity gains (i.e. frontier shift). However, if a regulator allocates all of that improvement to the cost challenge (as Ofwat does in the FD – see paragraph 114 et seq. above and 188 et seq. below) this cannot also be used to set harder outcomes targets (as that would be to double count the efficiency gain).

151. In summary, since firms, such as YWS, at the efficiency frontier cannot simultaneously reduce costs and improve outcome performance, Ofwat's required performance improvements cannot be achieved without costs funding and moreover expose YWS to material penalty risk.¹³⁰

Ofwat has intervened to produce a Performance Commitments and ODI package that does not meet the needs of YWS's customers, present or future

152. Turning now to Performance Commitments and ODIs, YWS developed an overall package of Performance Commitments and ODIs that incentivised it to deliver the outcomes its customers wanted, whilst also contributing to an appropriate overall balance of risk and reward in YWS's Business Plan. To do this, and as set out in paragraph 76 et seq., YWS undertook a comprehensive and innovative programme of customer engagement to inform the development of its proposed Performance Commitments and ODIs. Furthermore, as noted in paragraph 105, YWS undertook extensive risk analysis to ensure that its outcomes package was calibrated within Ofwat's indicated RoRE range and that risk was broadly symmetric (as is expected for an efficient company).
153. However, as set out in more detail in Annex 5:
- (a) Ofwat intervened extensively in YWS's ODI package (despite it suggesting that it did not intend to¹³¹). As previously mentioned, out of the 27 financial Performance Commitments that YWS proposed (or that Ofwat added through its determinations), Ofwat intervened in 19. This included intervening in all 10 of the financial common Performance Commitments that YWS proposed.
 - (b) Many of Ofwat's interventions are 'large' in magnitude. For example, more than doubling or halving incentive rates.
 - (c) Ofwat's interventions are asymmetric e.g. often making Performance Commitment levels more stretching and intervening to limit upside more than downside.

¹³⁰ Annex 4, Economic Insight report: Ofwat's approach to funding upper quartile performance.

¹³¹ See, for example, Exhibit 015 'Reflections on the price review – learning from PR14.' Ofwat (July 2015).

- (d) Ofwat’s approach to intervening is flawed because it makes arbitrary and unjustified changes to many of the individual parameters. Furthermore, it replaces the views of YWS customers with the regulator’s own view, and in addition it does not reflect the genuine differences between YWS and the rest of the industry.
- 154. The consequence of Ofwat’s interventions is that the FD ODI package is heavily skewed towards downside risk¹³² – which Ofwat could have established, if it had used a more robust approach to risk analysis.
- 155. In the following sections further details are provided as to why Ofwat’s approach to intervening is unsustainable and the consequences of this for the risk that YWS would face from the FD ODI package – points (d) and (e) above. Performance Commitment levels are discussed separately to incentive rates, caps and collars.

Ofwat’s Performance Commitments are not set at an efficient level

- 156. Ofwat’s Performance Commitment level interventions are flawed because they cannot be expected to align with the economically efficient level – that is, the optimal level that balances efficient costs with what YWS’s customers are willing to pay.¹³³
- 157. Instead of targeting the economically efficient level, Ofwat sought to impose what it calls ‘stretching but achievable’ target levels.¹³⁴ This term has no meaning in economic theory and is unrelated to any recognised measure of efficiency. Furthermore, Ofwat itself provides no definition of what this term means; and, in practice, it applied a range of different interpretations (as evidenced by the numerous different tests it applied to check whether companies’ proposed Performance Commitment levels were ‘stretching but achievable’). Ofwat intervened extensively where it considered company targets were not ‘stretching but achievable’, despite the fact that the arbitrary nature of imposed targets meant that they would not be expected to align with the economically efficient level. This also serves as an example whereby the ‘evidential hurdle’ to which companies themselves were held would appear to be much higher than that which Ofwat applied to itself and which certainly was not explicable by reference to any alleged “information asymmetry”.¹³⁵ The nature of Ofwat’s interventions in relation to different types of Performance Commitments are briefly expanded upon in the following paragraphs.

¹³² See Annex 5, Economic Insight report: Ofwat’s approach to ODI interventions in the final determinations, section 8.3.

¹³³ See Annex 5, Economic Insight report: Ofwat’s approach to ODI interventions in the final determinations, section 7.1 for further details.

¹³⁴ Exhibit 035, Ofwat: PR19 FDs: Policy summary, pages 3, 9, 10, 34, 42, 67.

¹³⁵ See paragraph 131, above.

Ofwat's shifting approach to UQ Performance Commitments

158. As outlined in paragraph 139, Ofwat required companies to set their Performance Commitment levels at the forecast UQ of industry performance for three of the comparable Performance Commitments: supply interruptions; internal sewer flooding; and pollution incidents. Ofwat did not, however, specify how companies should estimate the forecast UQ. Once Ofwat received companies' proposed Performance Commitment levels in September 2018 (which reflected companies' estimates of the forecast UQ), it calculated the UQ of companies' proposed levels. Ofwat then used its calculated UQ to apply a blanket target for internal sewer flooding and pollution incidents. For supply interruptions, Ofwat relaxed the method, as it did not consider the target was "*an appropriate expectation for the sector*".¹³⁶ Consistent with this approach, at the 4 February 2020 Teach-in, Ofwat explained to the CMA that it "*saw no reason why companies should differ in their performance*" in relation to these three common Performance Commitments.¹³⁷
159. However, Ofwat's approach to these common Performance Commitments is unsound because:
- (a) There is simply nothing in the calculation to suggest that Ofwat's forecast UQ is equal to the economically efficient level. There is also no reason to believe that it would coincide with it.
 - (b) The approach does not take account of differences between companies. What is efficient for one company will not be efficient for another. This is due to differences in the solutions available to improve performance, the efficient costs of these solutions and differences between customer preferences. Furthermore, companies will have different 'starting points', which will in part be a result of policies, targets and incentives set at PR14 (noting that efficient marginal costs and benefits can vary significantly, depending on the starting point).
 - (c) Even if an efficient company could achieve the forecast UQ for one of the measures, it is unlikely to be able to achieve the forecast UQ for multiple Performance Commitments. This is because a technically efficient company can trade-off performance in different service areas (and between costs and outcomes in totality) but it cannot 'do more for less' across all Performance Commitments.
160. Further to point (b) above, the importance of recognising differences in efficient costs and benefits across companies can be well illustrated by the example of internal sewer flooding. Here, YWS is disproportionately affected by regional and company-specific circumstances:

¹³⁶ Exhibit 037, Ofwat, Final Determination, Delivering Outcomes For Customers Policy appendix <https://www.ofwat.gov.uk/wp-content/uploads/2019/12/PR19-final-determinations-Delivering-outcomes-for-customers-policy-appendix.pdf>.

¹³⁷ Exhibit 013, Transcript of the 4 February 2020 Ofwat Teach-in, page 45, lines 3-4.

- (a) There is a much higher proportion of properties with cellars in Yorkshire than the industry average. As explained at paragraph 37, over 70% of sewer flooding instances occur in cellared properties. Cellars are at the same height or lower than the sewer pipes, which means that ‘sewage escapes’ have a greater tendency to enter the property. Furthermore, many of these cellars are prevalent in ‘back-to-back’ terrace properties, which means one sewage escape can affect multiple properties which can be difficult to access. In combination, these factors exacerbate the likelihood, duration and severity of internal sewer flooding incidents for YWS.¹³⁸
- (b) YWS is also starting from a lower level of performance, due to the way in which its target was set at PR14. In setting the comparative targets at PR14, Ofwat had to convert company-specific measures into a standardised performance commitment to allow it to apply a UQ target. For YWS, Ofwat had to make significant adjustments for certain assets (where private sewers had been transferred into the network) as well converting the measure from *incidents* to *properties*. The adjustments were significantly larger for YWS than for any other company, resulting in YWS receiving a target of a much higher number of properties where internal sewer flooding can occur before YWS is penalised (i.e. a less demanding target¹³⁹) than other companies. However, for PR19, Ofwat’s new industry standard definition for internal sewer flooding removed these adjustments, which results in YWS having to make a disproportionately large improvement of 73% to move from the Year 5 target of PR14 (2019-20), to the Year 1 target of PR19 (2020-21)¹⁴⁰.
- (c) YWS recognised that these factors would create a significant challenge in achieving the PR19 forecast UQ target for internal sewer flooding. Following Ofwat’s draft Methodology (***Draft Methodology***) in June 2017, which signalled that a step change in performance was required, YWS adopted an ‘early start’ approach to the period by implementing an accelerated performance plan in early 2018. The financial outperformance from efficiency gains in the PR14 period was reinvested to support the ambitious catch up plan. The approach was supported by YWS’s customers and Ofwat, and allowed the company to earn rewards against the PR14 regulatory targets to offset the immediate investment requirements and the potential significant penalties likely in PR19. However, throughout the course of 2019-20, it became clear that making such a step change in performance in such

¹³⁸ Exhibit 038, YWS, PR19 Business Plan, Appendix 8k YKY WWN+01 ‘Cellared properties’.

¹³⁹ The PR14 internal sewer flooding Performance Commitment related to the total number of incidents of internal sewer flooding of homes and businesses annually. Therefore, a higher number of properties is a less demanding target.

¹⁴⁰ The PR14 FD target in 2019-20 is 1919, compared to the PR19 FD for 2020-21 of 516. See Exhibit 039, Ofwat, PR14 final determinations upper quartile comparative assessments: internal sewer flooding.

a short period of time was operationally unfeasible. YWS provided evidence to Ofwat as part of YWS's DD Representations that company-specific factors, such as the difficulty of accessing customers' cellars¹⁴¹ and extreme weather events, which caused significant flooding in the region, had compromised YWS's ability to bridge the gap created by Ofwat in the Performance Commitments.

161. Ofwat's approach to the three comparable UQ Performance Commitments is particularly concerning, because the potential inappropriateness of UQ performance targets was expressly considered by the CMA in its PR14 redetermination for Bristol Water, where it found: "*Ofwat stated that it considered that (particularly for inefficient/poorly performing companies), the economic level was likely to be closer to the upper quartile performance level than the level proposed in the business plans. We considered this to be an overly simplistic representation of the circumstances. As was recognised in the assessment of leakage, local issues can significantly influence the true economic level of performance. Although the extent to which this is true will differ between metrics, we were not convinced that a blanket use of the industry upper quartile target was a superior method.*"¹⁴²

Ofwat's flawed approach to YWS's leakage target

162. As explained in paragraph 32 et seq. above, YWS supports Ofwat's policy of reducing leakage below the SELL in Yorkshire. This is why YWS committed to a 25% reduction in leakage in its Business Plan and began investing Totex outperformance in AMP6 to improve performance in this area. However, YWS did not contemplate at that stage that Ofwat would not allow funding to achieve such a significant improvement in performance.
163. When this became apparent at the IAP stage of PR19, YWS had no choice but to revisit its leakage plans and instead lower its target to that mandated by Ofwat (i.e. 15%).
164. Moreover, Ofwat's decision to set the Performance Commitment level at a 15% reduction (by the end of AMP7) was not supported by sound evidence. It would appear that Ofwat used the fact that one company proposed a 14% reduction at PR14 as the basis for the PR19 15% leakage target for most companies, including YWS. However, there is no economic or engineering rationale for why a 15% reduction is an appropriate target, or would coincide with the economically efficient level for YWS or indeed any other company. If it did represent the economically efficient level for one company, or for the industry in aggregate, it is highly unlikely to be the economically efficient level for every individual company. Again, given differences in terms of costs, customer preferences and 'starting points', the economically efficient level will vary between companies.

¹⁴¹ See Exhibit 040, Ofwat Annex Y001, letter from Nevil Muncaster to David Black, 1 November 2019.

¹⁴² Exhibit 041, Bristol Water plc: A reference under section 12(3)(a) of the Water Industry Act 1991, Appendix 9.1, paragraphs 14-15.

165. That said, as mentioned in paragraphs 3 and 110 above, YWS in its Business Plan recognised and responded to the importance of a reduction in leakage based on its extensive customer feedback and in fact proposed an even more demanding target of 25% as part of its overall package of measures addressing customers' stated requirements (again, for which YWS reasonably expected Ofwat to allow funding). It is a highly regrettable feature of PR19 that Ofwat has forced customers to accept a lower leakage target than companies had been prepared to commit to. Moreover, in the absence of the required funding, even the lower 15% level of reduction presents a significant challenge to YWS.

Ofwat's disconnect between leakage reduction and mains repairs

166. The flaws in Ofwat's approach to setting performance targets are not limited to the Performance Commitments discussed above. One particularly important example for YWS is that of mains repairs.
167. At previous price controls, YWS was set asset health targets (for which mains repairs is a component) at stable company-specific levels. For PR19, YWS proposed an improving level of performance that was linked to its leakage target. One of the fundamental activities all water companies undertake to reduce leaks from their network is to repair the water pipe mains, so the two indicators (leakage and mains repairs) work in opposite directions from each other.
168. However, Ofwat failed to recognise this interaction and intervened in its DD to impose a 38% improvement in the target between 2019-20 and 2020-21. To ensure that YWS were able to meet this step change in target would, in effect, require YWS to renew its structural mains at a rate equivalent to replacing approximately one third of the water network (12,550km), costing in excess of £1bn, in a single year.
169. Ofwat belatedly recognised in the FD the interaction between leakage and mains repairs and adjusted YWS's mains repairs target by a small factor to account for leakage improvements. However, the improvement target set in the FD still requires a 34% performance shift for mains repairs, albeit over a 5-year period.¹⁴³ The probability of YWS achieving this target is extremely low, particularly in conjunction with a 15% improvement in leakage.¹⁴⁴

Other common and comparable Performance Commitments

170. For other common and comparable Performance Commitments, Ofwat intervened to set YWS's target levels based on ill-thought-out industry comparative assessments that did not take account of YWS's unique circumstances e.g. setting levels at the UQ of proposed percentage improvements and the median of proposed levels. Ofwat decided that these levels were 'stretching and achievable', without any sound evidential basis.

¹⁴³ Exhibit 029, Ofwat: YWS Final Determination, pages 16-17, 20.

¹⁴⁴ Annex 1, Economic Insight report: Financeability of the notionally efficient firm: a bottom-up analysis, Figures 40-42, pages 62-63.

Again, therefore, there is no reason to believe that these ad-hoc calculations reflect the economically efficient level for YWS.

171. For example, YWS included a Performance Commitment for drinking water contacts, which measures the number of times YWS is contacted by its customers in relation to the quality and appearance of drinking water. The measure itself was introduced as a UQ Performance Commitment at PR14, however Ofwat did not include it in the required common Performance Commitments for PR19.¹⁴⁵ YWS nonetheless chose to retain the commitment at PR19, as its customer research and engagement identified it as a priority for customers.
172. The target Ofwat set YWS at PR14 was extremely challenging. The high proportion of upland water sources and the predominant type of water pipes in Yorkshire (i.e. cast iron) contribute to the discoloration of drinking water, increasing drinking water contacts. As expected, YWS was unable to meet this target during AMP6 and so chose to 'roll forward' the same target for PR19, to allow a more realistic time period to achieve the improvement.
173. However, Ofwat intervened to set a further 30% improvement in drinking water contacts at FD, based on comparisons of other companies' forecast performance, failing to recognise either the specific regional circumstances affecting the ability of YWS to achieve the targets, or the inevitable cost requirements to meet them. These issues have been communicated to Ofwat consistently since PR14. However, Ofwat's continued approach to 'one size fits all' performance target setting again results in YWS facing an unmitigable penalty risk in AMP7.
174. Ofwat need not have taken the flawed approach to Performance Commitment levels that it did. It could have undertaken its own robust economic and engineering analysis (with suitable sensitivity checks) to form a view as to what the economically efficient level of outcomes could reasonably be expected to be. Ofwat received an early submission from companies with the details of their proposed ODI definitions in May 2018, four months before the companies' business plans were submitted. Instead, Ofwat has relied on policy positions (primarily a view that targets should be 'stretching but achievable', without that being defined) and inappropriate industry comparisons that are not in the interests of YWS's customers. A more detailed description of Ofwat's interventions in incentive rates can be found in the accompanying report by Economic Insight.¹⁴⁶ This makes clear that Ofwat's adjustments to Performance Commitment levels are based primarily on simplistic industry comparative analyses and so do not take account of whether target levels

¹⁴⁵ Ofwat provided no explanation for the exclusion of the commitment at PR19, although companies made substantial representations during PR14 to highlight to the regulator that the measure was not appropriate for comparison as it is not an activity directly within management control (i.e. the propensity for customers to contact the company about water quality issues will be determined by a number of unrelated socio-economic factors).

¹⁴⁶ Annex 5, Economic Insight report: Ofwat's approach to ODI Interventions in the Final Determinations. See in particular sections 4.1; 6.1; 7.1; and Table 4 in Annex A.

should vary by company and to what extent. Moreover, the precise implementation of the interventions varies considerably across individual targets (e.g. sometimes it is the UQ level, sometimes the UQ rate of change, sometimes the median) without any clear evidential basis.

Errors in Ofwat's approach to incentive rates, caps and collars

175. YWS notes that Ofwat has suggested that any Performance Commitment levels contained in company business plans were proposed of their own volition (thus implying that companies in all cases considered those targets to be appropriate). This is an inaccurate characterisation of how plans were developed. For example, in relation to leakage, Ofwat's Final Methodology stated:

"Companies should set stretching leakage performance commitment levels to:

- achieve forecast upper quartile performance (in relation to leakage per property, per day and leakage per kilometre of main per day) where this is not being achieved – or justify why this is not appropriate;*
- achieve at least a 15% reduction in leakage (one percentage point more than the largest reduction commitment at PR14) – or justify why this is not appropriate; and*
- achieve the largest actual percentage reduction achieved by the company since PR14 – or justify why this is not appropriate."*

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176. This is clearly an instruction (Ofwat stated companies 'should', rather than 'could', set targets in this way).¹⁴⁸ In addition, YWS would highlight that: (i) in the subsequent stages of the determination process, companies that did not follow these types of instructions from Ofwat were marked down and/or required to make changes by Ofwat;¹⁴⁹ and (ii) various companies had previously drawn to Ofwat's attention the flaws in setting targets in such an arbitrary manner. Once the PR19 methodology was finalised by Ofwat, YWS sought to comply with it, whilst also aligning its proposals as closely as possible to the interests of its customers (to the extent the Final Methodology

¹⁴⁷ Exhibit 017, Ofwat, PR19 Final Methodology, page 65.

¹⁴⁸ YWS notes that Ofwat stated that companies could deviate from these targets if they provided compelling evidence. However, as per the first bullet above, in practice Ofwat mandated this. Ofwat had decided the formulation of targets before it knew what level they would imply (e.g. forecast UQ). Further, these targets are not the economically efficient level. Therefore, it is unclear what evidence companies could have provided that Ofwat would have accepted.

¹⁴⁹ For example, at IAP, Thames Water was required by Ofwat to revise its proposed leakage target, so that it reflected Ofwat's view of the forecast UQ. Similarly, at IAP, Affinity Water proposed a 14% reduction in leakage. Ofwat did not accept this, stating that *"the company should reconsider its proposed service levels and ensure that they are stretching and meet the upper quartile values."* As per Thames, Ofwat set out its view of said forecast UQ.

allowed). Clearly, that does not mean YWS implicitly endorsed Ofwat's mandated approach which, as explained in the following paragraphs, suffers from serious flaws.

177. Ofwat's general approach to intervening in YWS's ODI incentive rates is flawed because it moves YWS's rates arbitrarily closer to the industry average. YWS's proposed incentive rates reflect the views of its customers, which were gathered through extensive customer engagement. However, Ofwat's interventions effectively replace the view of YWS's customers with Ofwat's view. This is problematic and consistent with the much broader shortcoming in Ofwat's approach noted above: namely that it fails to reflect differences between customer preferences across companies.
178. Ofwat's position in its FD (of making ODI incentive rates 'more similar') is further at odds with its approach to developing the Final Methodology for PR19 in the first place. Specifically, Ofwat designed a methodology predicated on a view that genuine differences could exist between companies and that these should be reflected in company incentive rates. That is to say, Ofwat encouraged companies to undertake their own individual research and propose incentive rates that reflected their customers' preferences and their own efficient costs. However, Ofwat has subsequently taken the opposing view – that there should be limited variation between companies (i.e. it is now assuming the variation is 'measurement error', rather than reflecting real differences in customer preferences or efficient costs).¹⁵⁰
179. Ofwat has no evidence to support this view, precisely because it adopted the first perspective when designing its methodology. If at the outset, Ofwat was genuinely concerned that significant variance across companies would likely indicate 'measurement error', it could have easily addressed that in its methodology (either by being more prescriptive as to how companies should develop evidence, or the regulator itself undertaking a single consistent set of cross company research – either of which would have allowed it to identify measurement error). For example, Ofwat could have conducted its own robust risk analysis (as detailed in paragraph 183 et seq. below). This could have included drawing on historical industry data, forecast industry data and expert engineering judgement to form evidence-based views of likely levels of performance. Ofwat could have subsequently conducted Monte Carlo analysis, as it suggested to companies (many of which did, including YWS).
180. The fact that Ofwat did not do so, as above, seems consistent with its view at the time being that variance would likely reflect genuine differences across companies. In summary, Ofwat is now not able to distinguish between genuine differences in customer preferences and 'measurement error', because of the very methodology it applied. Yet, it now seeks to apply an entirely different perspective, despite the absence of evidence which is of its own making.

¹⁵⁰ Exhibit 042, IAP Technical appendix 1: Delivering outcomes for customers, Ofwat (January 2019); page 10.

181. In addition to the above methodological shortcomings, Ofwat's approach to intervening in ODI incentive rates is further flawed for the following reasons:¹⁵¹

- (a) For many Performance Commitments, Ofwat assessed the appropriateness of incentive rates based on an arbitrarily defined 'reasonable range' that is not supported by any evidence or theory and does not adequately reflect the genuine differences that arise across companies.
- (b) Ofwat's approach disregarded the views of YWS's customers. A clear example of this is where it intervened on YWS's standard incentive rates for leakage, despite Ofwat explicitly saying that it did not have any concerns with the underlying research or how YWS had calculated the incentive rates.
- (c) In some cases, Ofwat intervened on the basis of PR14 incentive rates, despite itself raising concerns about the robustness of PR14 incentive rates and YWS noting the lack of comparability with PR19 incentive rates.
- (d) Ofwat takes an inconsistent approach to whether incentive rates around better levels of performance should be lower than those around worse levels of performance (reflecting diminishing marginal returns).

182. In relation to caps and collars, Ofwat's interventions are flawed because they are based on misleading risk analysis and are designed to give rise to asymmetric risk. For example:¹⁵²

- (a) Ofwat's general approach to intervening in caps and collars was based around 'transposing' and adjusting risk ranges estimated by companies. This approach has no sound evidential basis.
- (b) In some cases, Ofwat set caps deliberately 'tighter' than it set collars (i.e. such that YWS is more likely to hit the cap than it is to hit the collar). This contributes to the asymmetric risk that YWS faces from Ofwat's interventions (discussed further below).

The combined effect of Ofwat's interventions is skewed to unsustainable downside risk

183. The combination of changes to Performance Commitment levels, incentive rates, caps, and collars affects the financial risk that YWS faces. The interventions affect both the expected revenue impact of the ODI package (and therefore, the overall expected return) and the risk range around that expected level. As such, it is highly important that the overall impact of Ofwat's numerous individual interventions are assessed.

¹⁵¹ As discussed in more detail in Annex 5, Economic Insight report: Ofwat's approach to ODI interventions in the final determinations, section 7.3.

¹⁵² As discussed in more detail in *ibid*, section 7.5.

184. However, following its extensive series of piecemeal changes to YWS's ODI package, Ofwat failed to consider or model the overall impact on risk to YWS.
185. As is set out in further detail in a report by Economic Insight,¹⁵³ Ofwat did not undertake its own risk analysis of YWS's ODI proposals or the impact of its interventions on them. Instead, Ofwat's stated view of ODI risk ranges in the FD is entirely based on the risk analysis conducted by companies themselves, to which Ofwat made a myriad of adjustments. The net result of these adjustments gives rise to a false impression of broadly symmetrical risk. Significant shortcomings in Ofwat's approach include:
- (a) For individual Performance Commitments, Ofwat assumed that the most likely (and, in practice, expected) level of performance was equal to Ofwat's proposed Performance Commitment level. This is akin to saying 'the expected performance level is whatever Ofwat says the target is.'
 - (b) In practice, because Ofwat has not undertaken its own risk analysis, and because its proposed Performance Commitment levels are set based on 'arbitrary rules' (i.e. do not therefore coincide with the economically efficient level), it is logical to suppose that its Performance Commitment levels are not those that an efficient firm would be expected to achieve.
 - (c) Ofwat's calculation of the range of potential performance levels is based around 'transposing' company estimated risk ranges (which companies had estimated with respect to their own proposed targets) around Ofwat's view of the Performance Commitment target level (as noted in paragraph 158 above). This is likely to lead to underestimating downside risk and overestimating upside potential.
 - (d) Ofwat's calculation of overall package risk is based on 'adding up' individual Performance Commitment risk ranges, and then making arbitrary and illogical adjustments (including an asymmetric adjustment for 'pessimism bias').
186. Contrary to what Ofwat's analysis suggests, YWS can be expected to face a material downside skew from Ofwat's interventions in its ODI package. This is because (i) YWS's proposed package was based on customer evidence and so should be aligned to that of an efficient firm; (ii) its proposals were underpinned by risk analysis; (iii) as above, Ofwat's interventions significantly revised this package, including setting targets likely to be 'beyond' the efficient level; and (iv) Ofwat's broader methodology does not make allowances for YWS to recover the efficient costs necessary to deliver these improvements.

¹⁵³ Annex 2, Economic Insight report: Ofwat's approach to risk analysis in the final determinations.

Conclusion on ODIs – no longer aligned with customer preferences and downside skew

187. The consequences of Ofwat’s interventions are that:
- (a) YWS’s ODIs are no longer aligned with its customer preferences for performance improvements, which results in distorted and uneconomic incentives; and
 - (b) there is a downside skew towards YWS carrying a greater risk of ODI penalties and Ofwat has no meaningful understanding of the extent of that risk.

Flaws in Ofwat’s Cost Modelling

188. As explained at paragraph 59 et seq. above, one of the three main building blocks of the FD is Ofwat’s efficient cost allowance for base and enhancement expenditure. The way in which Ofwat has gone about this is seriously flawed in a number of material aspects. The overall effect of this is that Ofwat has allowed insufficient funding for YWS to deliver its Business Plan. When combined with the other flaws in the FD (i.e. those relating to outcomes and WACC/financing) this underfunding will cause significant long-term harm to YWS, its customers and the environment, as described in Section H below.
189. The individual flaws in Ofwat’s cost assessment that combine to produce this result are set out in summary form below. Further economic evidence to support these points is provided in Annexes 8, 9 and 10.

A flawed catch-up efficiency challenge

190. **Inappropriate efficiency benchmark and inability to distinguish inefficiency from other factors:** At the 4 February 2020 Teach-in, Ofwat stated that “*Econometric models allow us to distinguish between the relation of costs that are due to efficiency and the relation of costs that are due to legitimate factors*”.¹⁵⁴ Contrary to its statements to the CMA, Ofwat’s models do *not* allow it to distinguish between cost differences that are due to managerial inefficiency and cost differences that are due to other factors.
191. Ofwat’s econometric approach simply results in an unexplained residual cost. Ofwat then makes a completely ad hoc adjustment by selecting a specific benchmark to separate ‘inefficiency’ from ‘noise’ (e.g. data or modelling errors). However, this ad hoc separation is likely to result in data errors, model misspecifications and omitted factors being inappropriately considered as inefficiency.¹⁵⁵ The latter is particularly problematic because Ofwat’s cost models ignore important cost differentiators such as service performance measures.¹⁵⁶ Thus, Ofwat may have judged YWS to be inefficient when in fact

¹⁵⁴ Exhibit 013, Transcript of the 4 February 2020 Ofwat Teach-in, page 29, line 11.

¹⁵⁵ See above, paragraph 141.

¹⁵⁶ See Annex 10, See Annex, Oxera report: Issues with Ofwat’s approach to determining the cost benchmark, page 5.

it was not.¹⁵⁷ Instead, Ofwat could have used a different modelling approach (for example, stochastic frontier analysis) or used such approaches to check whether its assumptions were appropriate.

192. Moreover, in the FD, Ofwat changed its choice of benchmark for Botex plus (i.e. base operating expenditure and capital maintenance) from the UQ (which it had used at the IAP and DD stages) to the fourth ranked company for water and the third ranked company for wastewater. Ofwat's justification for this was that it did not consider the overall degree of stretch to be large enough.¹⁵⁸ This choice and movement to an even more stringent benchmark was not based on any empirical evidence.
193. Ofwat's approach removes the same amount of 'noise' from the unexplained residual. However, noise is company-specific and it is unlikely that Ofwat's blanket ad hoc adjustments were correct for every company. Ofwat's benchmark choice takes no account of the actual uncertainty in its modelling, which is specific to each company. Analysis undertaken by Oxera shows that there is a significant level of uncertainty in Ofwat's analysis, which manifests in the form of significant uncertainty in cost predictions, in the identification of benchmark companies (i.e. classification of inefficient and efficient ones), and in the inability to separate modelling noise from inefficiency. Oxera demonstrates this using a number of analytical approaches. Its analysis is presented in Annex 10.
194. In Ofwat's Overview, Ofwat also argues that its catch up challenge could have been more challenging as it did not consider the scope to 'catch up' with efficient companies outside of the sector.¹⁵⁹ However: (i) the water sector has been regulated with efficiency targets, using comparative competition to mimic the dynamics of the competitive market, and incentivised to outperform those targets for over 30 years; and (ii) the sector makes significant use of competitive tendering, alliances and contractors all of whom work in a competitive sector. The analysis by Oxera in Annex 10 addresses the issue of benchmarks used in the FD and shows that the efficiency range in PR19 water and wastewater is about 4 to 5 times higher than that in ED1 (electricity distribution).¹⁶⁰ Ofwat has provided no evidence to justify its benchmark at any point in PR19.
195. For enhancement expenditure, Ofwat's choice of benchmark is even more problematic:

¹⁵⁷ Annex 8, Oxera report: Accounting for cost and outcomes, section 3, pages 6-8. Oxera's modelling shows that when controlled for factors such as service quality, as Ofwat should have done, YWS's cost allowance is materially increased.

¹⁵⁸ Exhibit 008, Ofwat, PR19 final determinations: Securing cost efficiency technical appendix, page 33.

¹⁵⁹ Exhibit 002, Ofwat's Overview, paragraph 4.49.

¹⁶⁰ Annex 10, Oxera report: Issues with Ofwat's approach to determining the cost benchmark, Table 3.3, page 7.

- (a) Ofwat's enhancement cost models are relatively simple: they use either simple unit cost or econometric models with one or two cost drivers. As such, it is highly likely that they omit important cost drivers (e.g. only one of Ofwat's P-removal¹⁶¹ models accounts for the impact of the Urban Waste Water Treatment Directive (*UWWTD*)).
 - (b) They are also based on forecast data (which is inherently uncertain) rather than outturn data (which its Botex plus models are based on).
 - (c) A number of Ofwat's enhancement models (e.g. Ofwat's P-removal model) are based on only ten observations, compared to 80 observations in Ofwat's wastewater Botex plus models. As a result, the estimated efficient cost predictions are inaccurate, with an implausibly large range of efficiency scores. Oxera shows that even an average benchmark from such models could only be justified if there were operational or engineering evidence that all relevant cost drivers had been captured.¹⁶²
196. Despite this, in numerous enhancement cost areas, Ofwat applied an efficiency challenge based on a UQ benchmark. This choice of benchmark is clearly flawed given the low accuracy of the cost predictions.¹⁶³
197. Some examples are set out below which demonstrate why, because it failed to include all relevant cost drivers, Ofwat's modelling was unable to distinguish inefficiency from other factors:
- (a) **Inability to distinguish inefficiency from other factors: failure to account for difference in performance or future improvements in performance.** Ofwat considered that its econometric cost models for base expenditure accounted for YWS's required stretching performance improvements. However, this is not the case because, as stated at paragraph 141 above, Ofwat did not include service performance measures in its cost models. To illustrate this problem, Oxera has shown that including leakage and supply interruptions in Ofwat's cost models (i) is feasible; (ii) the measures are statistically significant in explaining cost variations; and (iii) the resultant cost prediction for YWS is significantly higher as a result.¹⁶⁴ Annex 8

¹⁶¹ "P-removal" is a reference to the costs of removing phosphorous from wastewater.

¹⁶² YWS submitted evidence on the inaccuracy of Ofwat's models in Exhibit 043, Oxera (2019), 'Ofwat's enhancement modelling approaches at the IAP: a review', March, section 2.3. The criticisms of model quality presented in this paper remain broadly relevant at the FD. In particular, of the 8 modelled areas of enhancement highlighted: growth expenditure is now modelled within the base econometric models; Ofwat discarded econometric models for sanitary parameters, on the basis of low quality; the efficiency scores from models for the remaining 6 areas (P-removal, flow to full, spill frequency, storage in the network, chemical removal and first time sewerage) range from 79%-136% to 33%-350%.

¹⁶³ Exhibit 044, Oxera, Responding to Ofwat's draft determination of Yorkshire Water's cost allowance; Exhibit 043 Oxera, Ofwat's enhancement modelling approaches at the IAP: a review.

¹⁶⁴ Annex 8, Oxera report: Integrating cost and outcomes.

presents several analytical approaches that Ofwat could have considered over the course of PR19 to address the impact of performance on costs, but did not. Having not considered these approaches – some of which have been successfully developed by European sectoral regulators – extra caution was needed in setting the cost and outcomes targets, given the manifest disconnect between the two, rather than drawing the conclusion that the disconnect was inconsequential, based on theoretically invalid and misleading analysis.

- (b) **Inability to distinguish inefficiency from other factors: water treatment complexity.** YWS is expecting a significant increase in the required level of treatment complexity¹⁶⁵ in AMP7.¹⁶⁶ However, Ofwat's approach at FD cannot account for the type of increase in treatment complexity that YWS is expecting, so the expenditure associated with the raw water deterioration is currently unfunded. More appropriate, alternative methods of controlling for treatment complexity (e.g. using alternative cut-off thresholds) can account for this increased treatment complexity, and these models would increase YWS's allowance significantly.¹⁶⁷ Similarly, on wastewater, YWS is facing statutory requirements to tighten phosphorus consents.¹⁶⁸ However, Ofwat's models only controlled for tightness of ammonia consents, so this increased expenditure was also unfunded.
- (c) **Inability to distinguish inefficiency from other factors: Phosphorous-removal (enhancement):** YWS is significantly more affected by the UWWTD than other companies. The UWWTD requires treatment of wastewater as opposed to solutions that prevent the phosphorous entering the water at all. Such solutions are significantly more expensive than the alternatives. Following YWS's DD Representations,¹⁶⁹ Ofwat introduced a third model that took into

¹⁶⁵ The complexity of treatment reflects both the quality of the raw water source supplying the treatment process and the treated output quality requirement. Where complexity is higher, costs are expected to increase due to the challenge of maintaining and operating multiple stages of treatment that utilise significant amounts of consumables, such as power and chemicals.

¹⁶⁶ YWS has a programme of 6 WTW (Chellow, Sladen, Oldfield, Fixby, Embsay and Tophill Low) where it is required to add additional treatment processes to meet DWI quality guidelines due to raw water deterioration. Adding these processes increases the complexity of the works in 'complexity band definition'.

¹⁶⁷ The cost drivers used to capture treatment complexity (the proportion of water treated in complexity bands W3–6 and the weighted average complexity measure (log)) are inadequate to capture the type of treatment complexity that YWS is expecting. At the IAP and DD, Oxera demonstrated that alternative treatment complexity variables (such as the proportion of water treated in bands W5–6, the weighted average complexity measure in levels, and controlling for multiple treatment complexity variables in the same model) can materially increase YWS's cost allowance. See Exhibit 044, Oxera (2019), Responding to Ofwat's draft determination of Yorkshire Water's cost allowance, August, section 2. These arguments remain valid at the FD.

¹⁶⁸ Phosphorus consent levels are the maximum amount of phosphorus discharges to the environment.

¹⁶⁹ Exhibit 045, Oxera (2019), WINEP: phosphorus removal, August.

account the impact of the UWWTD, but then averaged the outcomes of this model with those of its two original, flawed models, lowering the impact of the UWWTD on YWS's estimated efficient cost by £29m.¹⁷⁰ One way to better account for the impact of the UWWTD would have been to use only the model that Ofwat developed for the FD. However, Ofwat should have also considered a less onerous benchmark (see paragraph 195 above) and bottom-up approaches to assess YWS's P-removal expenditure, given the limitations of the data and the poor quality of the models.¹⁷¹ The implications of Ofwat's approach on YWS's resilience and environmental position are discussed at paragraphs 286 et seq. and 300 et seq. below.

- (d) **Inability to distinguish inefficiency from other factors: Business rates:** Business rates are subject to only a limited degree of influence by YWS. In the FD Ofwat introduced an 'uncertainty mechanism' for business rates. However, this only partially mitigated against potential increases in asset stock or revaluation of existing stock. In setting YWS's business rates allowance, Ofwat underestimated the value of YWS's assets (particularly on wastewater), and this necessarily underestimated its efficient level of expenditure. Furthermore, Ofwat did not attempt to account for the impact of asset revaluations in AMP7, which can have a material impact on the amount companies are expected to pay.¹⁷²

- 198. **Not appropriately accounting for changes in future cost drivers:** Ofwat's approach to predicting future efficient cost levels relied on forecasting the future levels of the costs drivers included in its models. While Ofwat relied less and less on its own forecasts as PR19 progressed, in reaching the FD it has still relied upon those in relation to new connections, new mains and booster pumping stations, which reduced YWS's modelled base expenditure allowance by £14m in wholesale water.¹⁷³ Furthermore, if YWS's forecast of connections growth had been used to estimate the post-modelling adjustment for growth, its allowance would have increased by an additional £27m in water

¹⁷⁰ Post the overall additional WINEP UQ challenge (£32m prior to the UQ challenge).

¹⁷¹ The three P-removal econometric models used to set an allowance for Yorkshire each use 10 observations, with a range of triangulated efficiency scores across these three models from 50%-134%. See Exhibit 046, Ofwat (2019), Wholesale Wastewater Enhancement feeder model: P-removal.xlsx, Analysis section. While Oxera only examined the uncertainty in Ofwat's BOTEX plus models (see Annex 10, Oxera report: Issues with Ofwat's approach to determining the cost benchmark), it is likely that similar analysis would show greater uncertainty in Ofwat's P-removal and enhancement model, more generally.

¹⁷² This is explained in detail in Exhibit 043, Oxera (2019), Ofwat's enhancement modelling approaches at the IAP: a review, March, section 3.2.

¹⁷³ This can be calculated by replacing Ofwat's forecasts of cost drivers with YWS's, as shown in Exhibit 047, Ofwat (2019), Feeder model 4: Wholesale water – Water resources and water N+ cost allowances, December.

and £53m in wastewater.¹⁷⁴ YWS's cost drivers were developed alongside other areas of its plan, including enhancement and maintenance programmes. Ignoring YWS's forecasts for key variables created a disconnect between the costs that companies have planned to incur and the activity that they have planned to undertake. As YWS's cost driver forecasts are specific to its Business Plan and had rigorous assurance through its '3 lines of defence' approach, these forecasts, rather than Ofwat's, should have formed the basis of any forward-looking assessment.

A flawed frontier-shift that is inappropriately applied

199. **Inappropriate frontier shift:** Ofwat's frontier shift target of 1.1% is at the upper end of the range of 0.6–1.2% p.a. estimated by its consultant Europe Economics. However, the upper-end estimate is biased upwards. This is because it is heavily weighted towards pre-financial crisis performance (effectively disregarding the UK's industrial performance over the last 13 years) of the then stronger performing sectors of the economy.¹⁷⁵
 - (a) This upper bound is based on productivity growth estimated over a period of growth. Economic upturns can upwardly bias the estimate of long-run productivity growth and the future potential for frontier shift because productivity tends to increase during periods of economic growth.
 - (b) Selecting the best performing sectors is, by definition, upwardly biased. The construction industry, which is highly relevant for numerous activities the water sector undertakes, is completely dropped in deriving the upper end estimate given from Europe Economics' focus on the stronger performing sectors. Indeed, Ofwat itself says that "*it is better to consider productivity improvements of all comparator sectors in the round*" (emphasis added) which its analysis fails to do.¹⁷⁶
200. Since frontier shift assessment is a forwarding-looking expectation that is imputed from historical information, there is a higher level of uncertainty involved in its determination compared to catch-up efficiency assumptions which are anchored on outturn data. Ofwat's decision, based on Europe Economics' analysis, has several methodological flaws, has not addressed these uncertainties sufficiently, and has overstated the scope for frontier shift. Moreover, in the FD, Ofwat continues to rely on flawed evidence by KPMG and Europe Economics to indicate that an even higher scope for productivity improvement is feasible—giving a false basis of the true potential, which is lower than the 1.1% p.a. target that it set. Oxera's paper at Annex 9 addresses the papers relied on by Ofwat in more detail.

¹⁷⁴ This can be calculated by replacing Ofwat's forecasts of new connections (based on ONS data) with YWS's forecasts of new connections. See Exhibit 048, Ofwat (2019), Base Adjustment Model, December.

¹⁷⁵ For further details see Annex 9, Oxera report: Issues with Ofwat's frontier shift assessment in PR19.

¹⁷⁶ Exhibit 008, Ofwat, PR19 final determinations: Securing cost efficiency technical appendix, page 173.

201. **Double counting of frontier shift:** Even if the deficiencies in Ofwat’s approach to define the frontier shift target are addressed, inconsistencies remain in the FD, including its application to unmodelled costs (such as business rates) and the WINEP enhancement programmes. On the former, Ofwat’s decision rests on the assumption that uncontrollable costs form a similar proportion of expenditure in wholesale activities as they do in comparator industries. However, if that is not the case, the target, as currently applied, is not appropriate. Further, Ofwat has not shown any adequate evidence to support this choice. In relation to the latter, Ofwat’s use of a forward-looking benchmark for the WINEP enhancement programme will double-count the impact of frontier shift on companies’ cost allowances, and this reduces YWS’s WINEP allowance by £21m (see paragraph 140(c) above).¹⁷⁷

A flawed adjustment for real input price effects

202. **Failure to account for all RPEs:** Ofwat has represented to the CMA that it had “*looked at real price effects across the whole of the cost base*”.¹⁷⁸ As explained at paragraph 64 above, RPEs are changes in the costs faced by a company other than those caused by inflation, for example, labour costs. Ofwat has, however, failed in its cost model to account for all relevant RPEs affecting YWS e.g. energy and chemicals. This means that Ofwat’s efficient cost allowance for YWS is materially lower than it should be. YWS’s position is that Ofwat should have allowed for RPEs in relation to energy, chemicals, and materials, plant and equipment.

Conclusion on Ofwat’s flawed cost modelling

203. In summary, Ofwat’s: (i) unevidenced efficiency benchmarks; (ii) cost models that omit important cost differentiators and cannot distinguish differences due to inefficiency from those due to other factors; (iii) flawed and incorrectly applied frontier shift; and (iv) failure to account for all relevant RPEs, together mean that YWS has been awarded insufficient costs to deliver its Business Plan. This situation could have been avoided, as YWS made a number of representations on these points during the PR19 process. Despite this, Ofwat has to date failed adequately to justify its position. See also paragraphs 135 to 151 above which address other concerns arising from the treatment of costs in the FD.

Wholesale Revenue Forecasting Incentive Mechanism

204. This section sets out a revenue claim that YWS made during the PR19 process relating to an adjustment to the WRFIM. This claim resulted from YWS’s reliance on Ofwat’s guidance during AMP6.
205. In the PR14 wholesale water price control, YWS made a data input error in its submission to Ofwat. In table W9 of its submission, which sets out the line

¹⁷⁷ This is calculated by setting the frontier shift assumption to 0% in Ofwat’s enhancement aggregator feeder model. See Exhibit 049, Ofwat (2019), ‘Feeder model: Enhancement aggregator’, December.

¹⁷⁸ Exhibit 012, Transcript of the 11 February 2020 Ofwat Teach-in, page 19, lines 8-9.

items included in the wholesale water price control, it mistakenly included “connection charges income (S45)” (*S45 Income*) as “third party income” rather than “infra & connection charges (revenue)”.¹⁷⁹ This error incorrectly reduced the amount of revenue that YWS was entitled to recover from its customers under the wholesale water price control that Ofwat had set, as demonstrated by Table 10 below.

	Actual submission	Error Correction	Corrected submission
1 Wholesale control	377.204	(4.440)	372.764
2 Infra & connection charges (revenue)	-	4.440	4.440
3 Total wholesale water revenue	<u>377.204</u>		<u>377.204</u>
5 Bulk supplies	(0.092)		(0.092)
8 Third party income	<u>(5.612)</u>	4.440	<u>(1.172)</u>
9 Total third party	<u>(5.704)</u>		<u>(5.704)</u>
11 Other sources	<u>(1.316)</u>		<u>(1.316)</u>
13 Other income	<u>(0.158)</u>		<u>(0.158)</u>
14 Infra & connection charges (capital)	<u>5.787</u>		<u>5.787</u>
	375.813	4.440	380.253

Table 10: PR14 W9 schedule wholesale water price control forecasts for 2015-16 (£m)

206. YWS uncovered its error when preparing its APR (Annual Performance Report) for the 2015-16 financial period during AMP6. YWS immediately notified Ofwat of the error and requested guidance on how to proceed. YWS and Ofwat discussed three options to resolve the issue:
- (a) Change the wholesale price control to include the forecast for S45 Income;
 - (b) Deviate from the APR methodology and exclude S45 Income; or
 - (c) Include an amended calculation to exclude S45 Income and include a note from YWS’s actual capital grants and contribution reporting with a narrative explaining why the performance in the 2015-16 APR was incorrect.
207. After YWS and Ofwat discussed these options, Ofwat told YWS that it should take option (c).¹⁸⁰ Ofwat acknowledged that YWS had clearly made an error as part of that review process. Ofwat included the adjusted revenue performance

¹⁷⁹ For details of the error, see Annex 11, report by Mark Ballamy, section 4.2.

¹⁸⁰ This initial discussion took place via telephone, but the process was followed again in the 2016-17 and 2017-18 APR process – see Annex 11, report by Mark Ballamy, section 4.3 for the email exchanges confirming this option in those years.

within the Monitoring Financial Performance reports in 2015-16 and 2016-17. Ofwat agreed with YWS that this adjusted revenue performance would be reflected within the WRFIM in PR19.

208. In the Business Plan, YWS included an adjustment to the WRFIM to account for the error made at PR14 and Ofwat's proposed approach to accounting for the error from the 2015-16 APR onwards.¹⁸¹ At the IAP stage, Ofwat informed YWS that it should update various tables in order to demonstrate that it could properly adjust the WRFIM.¹⁸² YWS prepared a detailed explanation of the circumstances under which the error occurred and its interactions with Ofwat and set these out in its IAP response document.¹⁸³ At the DD stage Ofwat disallowed the claim, but gave very little explanation of its decision not to allow adjustment to the WRFIM.¹⁸⁴ It was not until the FD that Ofwat explained that it believed that the error described above and in Annex 11 was not an "unambiguous error" and that it disallowed the claim on those grounds.¹⁸⁵
209. The result of the intervention by Ofwat at FD compared to YWS's DD Representations reduced YWS's WRFIM allowance by around £36.7m. The adjustment in YWS's DD Representations did not take into account S45 Income for 2019-20, which is a further around £7.3m. This brings the total adjustment to approximately £44m.
210. In the YWS-Specific Paper, Ofwat submits the following: (i) it does not consider the error was unambiguous as the information supplied by YWS was not sufficiently disaggregated;¹⁸⁶ (ii) the correction is not unambiguous because YWS took no account of the potential impact on allowed Totex at PR14;¹⁸⁷ and (iii) YWS's proposed approach would remove the impact of the incentive to forecast accurately.¹⁸⁸
211. To point (i), independent accredited forensic accountant Mark Ballamy, who is *inter alia* a member of the Academy of Experts, has prepared a detailed report at Annex 11. This report clearly shows that the error YWS made at PR14 was

¹⁸¹ See Exhibit 001, YWS PR19 Business Plan, pages 242-243.

¹⁸² See Exhibit 050, Ofwat, Yorkshire Water: Accounting for past delivery detailed actions annex, action reference YKY.PD.A6.

¹⁸³ See Exhibit 051, YWS, Yorkshire Water IAP response document, pages 142-153.

¹⁸⁴ See Exhibit 052, Ofwat, Yorkshire Water draft determination – accounting for past delivery actions and interventions, pages 6-7. Ofwat's entire explanation was the two following quotes: "[T]he claim relates to errors the company made in completing its business plan tables for connection expenditure at PR14 and we consider this to be outside of the reconciliation mechanism's scope." "[T]he company does not provide compelling evidence that the amendment is appropriate and so we are removing the amendment."

¹⁸⁵ See Exhibit 053, Ofwat, PR19 Final Determinations, Yorkshire Water – Accounting for past delivery additional information appendix, page 3 et seq.

¹⁸⁶ See Exhibit 054, Ofwat, Reference of the PR19 final determinations: Explanation of our final determination for Yorkshire Water, paragraph 2.94.

¹⁸⁷ Ibid, paragraph 2.95.

¹⁸⁸ Ibid, paragraph 2.96.

unambiguous. YWS transparently submitted evidence to Ofwat during the 2015-16 APR showing that YWS had made an error, which Ofwat was satisfied with then. If Ofwat had requested further disaggregated data at any point in the PR19 process or if it had made YWS aware prior to the FD that it considered the error not to be unambiguous, YWS would have gladly shared further information.

212. To point (ii), Ofwat states that “*an error of the nature claimed by Yorkshire Water would have the effect of providing a higher totex allowance at PR14 than otherwise would have been the case.*”¹⁸⁹ This is not the case. In Table 10, above, the Totex allowance supporting line 3 for (i) the actual submission; and (ii) the corrected submission is the same. The difference is the S45 Income figure that was added, incorrectly, to line 8 (third party income), which is then subtracted from the Totex figure at line 3. Ofwat’s assertion that YWS was provided with a higher Totex allowance at PR14 that would partially offset the claim is therefore incorrect.
213. To point (iii), Ofwat states that YWS’s approach would “*remove the impact of the incentive to forecast accurately*”.¹⁹⁰ YWS’s error was not a forecasting error, but rather a simple data input error. Therefore, allowing the adjustment to the WRFIM would have no effect whatsoever on the incentive for companies to forecast accurately. Even if it were an error in forecasting, YWS pointed out the error to Ofwat and explored options to address the problem at the 2015-16 APR, before the vast majority of the proposed adjustment’s value had accrued.
214. In any event, the solution followed to adjust the WRFIM as a remedy to the error was not YWS’s idea: it was Ofwat’s suggestion as a result of its decision in the 2015-16 APR. Ofwat has stated that “*the discussions that took place with Ofwat staff did not and could not have resulted in an agreement to changes to the operation of WRFIM because those were decisions for the PR19 process.*”¹⁹¹ It would be an unwelcome development for water companies to be unable to take Ofwat at its word when collaboratively finding solutions to errors such as these. YWS was open and transparent with Ofwat from the start and has in good faith followed Ofwat’s guidance in its APR reporting for the whole of the AMP6 period. This changing of the goalposts undermines YWS’s confidence in the stability, effectiveness and fairness of the regulatory system.

Conclusion on YWS’s WRFIM claim

215. According to Ofwat’s FD, a simple remediable data input error should cost YWS £44m. What’s more, YWS discussed that error transparently and openly with Ofwat, collaboratively attempting to find a solution to the situation – a solution that Ofwat assured YWS was in place in 2016. YWS has been relying on that assurance ever since.

¹⁸⁹ Ibid, paragraph 2.95.

¹⁹⁰ Ibid, paragraph 2.96.

¹⁹¹ Ibid, paragraph 2.97.

WACC and financeability

216. This section addresses YWS's views on the WACC (weighted average cost of capital) and financeability. The following matters are addressed in turn: (i) the WACC calculation; (ii) Ofwat's gearing outperformance sharing mechanism; and (iii) financeability.

Ofwat has set the WACC too low

217. In its DD Representations, YWS drew attention to a number of errors and inconsistencies in Ofwat's approach to its WACC calculations. A number of those same errors remain in the FD as summarised below.

Risk-free rate, expected market return

218. The CMA has received extensive submissions on the cost of capital as part of its inquiry into NATS' price controls. YWS agrees with many of the points that regulated companies have put to the CMA, most notably in the papers by Economic Insight for NATS, by Oxera for the Energy Networks Association and by Professor Alan Gregory for three water companies.
219. YWS particularly endorses the arguments that these experts have made about:
- (a) the importance of using both nominal and index-linked government gilts as first proxies for the risk-free rate;
 - (b) segmentation in the market for UK government gilts, and the difficulty that there is understanding in economic terms how the CAPM risk-free rate can be negative in real terms for a sustained period of time; and
 - (c) the problems with recent attempts to restate established benchmarks for the expected market return in real, CPI-stripped terms in the absence of reliable CPI-like inflation data, especially for the period 1900 to 1948.
220. The CMA issued provisional findings in the NATS inquiry on 24 March 2020. YWS is still considering fully the CMA's analysis of these points and a number of other points related to the calculations of the risk-free rate and expected market return. Accordingly, YWS focuses principally in this Statement on the other capital parameters as they relate specifically to water and sewerage companies.

Beta

221. Ofwat's calculation of beta was 0.71. This estimate was obtained after examining share price data from Severn Trent and United Utilities and re-gearing empirical estimates of beta to Ofwat's notional 60% debt-to-RCV ratio.
222. The main issue that YWS would like the CMA to consider for its own estimate of beta is the time period for computing the UU and SVT betas, including the choice of cut-off date.
223. In previous price reviews, Ofwat took the position that it needed to:

- (a) look at rolling estimates of beta over a horizon of around least five years; and
 - (b) cut-off the data at a point before share price movements started to be affected by price review announcements.
224. In PR19, Ofwat departed from its previous approach by focusing on a short two-year window of estimates with a cut-off only at September 2019 for its FD. This had the consequence that Ofwat arrived at a lower estimate of beta than would have been the case had it applied its prior methodology.
225. YWS made its concerns about short-term, spot estimates known to Ofwat in its August 2019 response to the DD.¹⁹²
226. YWS asks the CMA to take the points that YWS made to Ofwat into account as it makes its own determination. In particular:
- (a) given the inherent imprecision and wide confidence intervals around empirical estimates of beta, YWS sees no reason why the CMA should depart from its established approach of looking at the average beta that a firm has had over a five-year window; and
 - (b) YWS considers it is important that the CMA ensures that share price ‘noise’ from Ofwat’s DD, FD, as well as the threat of renationalisation before and after the 2019 general election, does not enter and distort its beta estimates.
227. YWS’s analysis of UU’s and SVT’s betas over a five-year window to February 2019 indicates that the ‘unlevered beta’ of a water and sewerage companies (i.e. an asset beta calculated using a zero debt beta) is around 0.33, which equates to an equity beta of around 0.80 at 60% gearing.

Cost of debt

228. YWS has been supportive throughout PR19 of Ofwat’s overall approach to the cost of debt, including its separate allowances for embedded debt and new debt, and the decision to index the cost of new debt in line with prevailing market rates during AMP7. However, YWS has the following concerns with the FD’s cost of debt computations:

Embedded debt

229. Ofwat’s allowance for the cost of existing debt was based on its estimate of the interest that a company should notionally be paying after the credit conditions of the last 15 years. The CMA has previously stated that it will normally factor a company’s actual cost of debt into its calculations, provided that interest

¹⁹² See Exhibit 055, YWS DD Representation, Financeability, page 21; Exhibit 056, First Economics, Ofwat’s July 2019 Estimate of Beta.

costs have been prudently incurred.¹⁹³ YWS has calculated its embedded cost of debt at 31 March 2020 to be 4.93% (in nominal terms).

230. This calculation includes the costs associated with index-linked swap arrangements. In its PR19 work, Ofwat took a policy decision to ignore all derivatives and to reward only so-called “pure” interest costs. This ignores the reality of the way efficient companies have arranged their financing during the 2000s; evidenced by the extensive use of swaps across a number of companies. For YWS, irrespective of its gearing levels, the intention of these index-linked swaps was to imitate certain cashflows of index-linked debt, whereby real interest and inflationary element of future swap cashflows would better match respectively the allowed return through revenues and RCV indexation.
231. In particular, Ofwat appeared to forget that it relied in several of its previous price reviews on an assumption that an efficient company would arrange its financing so as to pay out only a real cost of debt to match the real cost of capital that it factors into price controls. There were two ways a company could achieve this: either issue RPI-linked debt or enter into swap arrangements that turned nominal coupons into real. YWS does not think that Ofwat has any basis to strike out costs associated with the latter approach.
232. YWS asks the CMA to factor into its cost of debt calculations:
- (a) its all-in cost of debt of 4.93% and to recognise, more generally, that Ofwat’s proposed allowance for embedded debt costs under-estimates the industry-average cost of debt due to the inappropriate exclusion of derivative-related expenses; and
 - (b) its actual embedded debt percentage into the cost of debt calculations to ensure consistency with YWS’s specific cost of embedded debt noted above. Based on FD figures YWS calculates its average embedded debt percentage to be 88% in comparison to the 80% used by Ofwat.

New debt

233. Ofwat’s determination said that the cost of new debt would be set with reference to the average yield on two iBoxx indices, less a deduction of 15 basis points. The chosen iBoxx indices were:
- (a) the non-financials A 10+year maturity series; and
 - (b) the non-financials BBB 10+year maturity series.
234. This does not give a valid benchmark for the interest costs that water companies will face during the next five years and is a questionable approach, if continued in future price reviews.

¹⁹³ See, for example, Exhibit 004, Bristol Water plc: A reference under section 12(3)(a) of the Water Industry Act 1991, paragraphs 10.87 et seq.

235. The cost of debt needs to be looked at in conjunction with the financial modelling that Ofwat produced alongside its FD, particularly the modelling of the interest cover that firms will have if they spend in line with the regulator's Totex allowances and perform in line with Ofwat's performance commitments. This modelling shows interest cover which is wholly incompatible with a sector-wide A rating, let alone out-performance of the iBoxx series.
236. Throughout the price review process there has been a continuing deterioration in the credit quality of the industry due to Ofwat's approach. This is best illustrated by the following series of publications from Moody's:
- (a) 15 January 2018 – "2018 outlook changed to negative as tough price review outweighs current performance"¹⁹⁴
 - (b) 22 May 2018 – "Regulator's proposals undermine the stability and predictability of the regime"¹⁹⁵
 - (c) 26 July 2019 – "Ofwat tightens the screws further"¹⁹⁶
 - (d) 8 October 2019 – "Rock of low returns meets hard place of covenants"¹⁹⁷
 - (e) 10 December 2019 – "Regulator's decision will cause sharp reduction in credit quality"¹⁹⁸
 - (f) 20 December 2019 – "Moody's reviews 12 UK water groups for downgrade"¹⁹⁹
237. In addition, S&P and Fitch have downgraded companies across the sector throughout the process. In particular, after assessing the impact of Ofwat's FD, S&P downgraded five of its 11 rated companies in February 2020, all of whom had accepted their FD.²⁰⁰

¹⁹⁴ See https://www.moodys.com/research/Moodys-changes-UK-water-sector-outlook-to-negative-as-Ofwat--PR_378176.

¹⁹⁵ See https://www.moodys.com/research/Moodys-changes-outlook-to-negative-on-ratings-of-4-UK--PR_383966.

¹⁹⁶ See <https://www.yorkshirewater.com/media/1773/appendix-f3-moodys-regulated-water-utilities-jul-2019.pdf>.

¹⁹⁷ See https://www.moodys.com/login?ReturnUrl=https%3a%2f%2fwww.moodys.com%2fresearchdocumentcontentpage.aspx%3fdocid%3dPBC_1194105.

¹⁹⁸ See https://www.moodys.com/research/Moodys-UK-water-industry-to-suffer-largest-credit-quality-deterioration--PBC_1206828.

¹⁹⁹ See https://www.moodys.com/research/Moodys-reviews-12-UK-water-groups-for-downgrade--PR_415722.

²⁰⁰ "Four U.K.-Based Water Utilities Downgraded On Tougher Regulations; Two Put On Watch Negative; Four Outlooks Negative" published on 25 February 2020, see <https://www.spglobal.com/ratings/en/research/articles/200225-four-u-k-based-water-utilities-downgraded-on-tougher-regulations-two-put-on-watch-negative-four-outlooks-neg-11362392>.

238. As a result of the ratings deterioration highlighted above the vast majority of companies will be raising debt in AMP7 with a rating in the range Baa1/BBB+ to Baa3/BBB. Therefore, the cost of debt would be more appropriately set with reference to the BBB iBoxx index only.
239. Consistent with the above, Economic Insight's bottom up financeability modelling shows only a very low probability that a notionally efficient firm would be able to secure a Baa rating on Ofwat's FD.²⁰¹
240. The evidence therefore shows very clearly that it is inappropriate to assume that companies' interest costs will track in line with higher quality, A rated bond yields. Given the dearth of A category ratings in the sector, the appropriate market benchmark for the cost of debt that companies will pay on new borrowing in AMP7 is the non-financials BBB 10+year maturity series with no deduction.

Issuance and liquidity costs

241. Whilst Ofwat's proposed allowance of 0.1% for issuance and liquidity costs is consistent with its prior determinations, a closer examination of regulatory precedent indicates that, typically, this is insufficient to recover the combined (efficient) costs of issuance and liquidity.²⁰²

Inflation

242. Ofwat's real terms allowed cost of debt allowances were calculated using the simple assumptions that RPI inflation will run at 3% per annum and CPIH inflation will run at 2% inflation. The OBR's March 2020 inflation forecasts are set out in Table 11, below.

	2020/21	2021/22	2022/23	2023/24	2024/25	AMP7 average
CPI	1.4%	1.9%	2.1%	2.0%	2.0%	1.88%
RPI	2.1%	2.9%	3.0%	2.9%	2.8%	2.77%

Table 11: OBR inflation forecasts, March 2020

243. The figures in this table show that latest OBR forecast is below Ofwat's assumed inflation levels. This means a smaller proportion of companies' interest costs will be remunerated through the indexation of RCV and that there needs to be a commensurate increase in the AMP7 real rate of return.
244. YWS asks the CMA to use the latest inflation outlook when it makes its own cost of debt calculations.

Retail market deduction

²⁰¹ Annex 1, Economic Insight report: Financeability of the notionally efficient firm: a bottom-up analysis.

²⁰² See Exhibit 057, 'Assurance Review and Assessment of the Evidence on the WACC at RP3.' Economic Insight (2019), pages 116-119.

245. Ofwat's allowed return was set 4 basis points below its estimate of the appointees cost of capital. YWS considers this to be an unnecessary legacy from PR14, when Ofwat dealt with circumstances that were materially different. A stand-alone paper on this matter is included as Annex 12.

Gearing outperformance sharing mechanism

246. Ofwat's FD contains a "gearing outperformance sharing mechanism" for PR19. This results in a downward adjustment to the allowed cost of capital for companies that have gearing ratios of over 70%.²⁰³ YWS disagrees fundamentally with the principle of this mechanism and is strongly of the view that the CMA should not need to include any such provision in its own determination.
247. Furthermore, YWS believes the approach that Ofwat has taken is unduly simplistic. It disregards the point that companies with different financing arrangements can operate at different levels of gearing with a similar cost of debt. In the water industry, this is represented principally by companies with unsecured financing arrangements and those, like YWS, with regulated debt platforms that take into account Appointment requirements.
248. The sharing mechanism operates in accordance with the following formula:
- Financial outperformance adjustment =
- (actual gearing % - 65%) x (allowed cost of equity - actual cost of debt) x 50% x closing nominal RCV.²⁰⁴
249. Ofwat has justified the mechanism by arguing that companies with high gearing achieve a lower vanilla WACC than other companies, and specifically that: *"investors in such companies take the benefit of the difference between the cost of equity and the cost of debt for the actual proportion of gearing that is above our notional assumption"*.
250. Ofwat's position is that this supposed gain should not go solely to shareholders but should instead be shared with customers 50:50.
251. The idea that companies with gearing of more than 65% can profit by taking the cost of equity from customers for a portion of their financing but pay out only the cost of debt to lenders is not, however, one that any economist or financial expert would recognise. Contrary to Ofwat's assertion, a company that gears up cannot treat the costs of equity and debt as fixed numbers. Rather, increasing the amount of the RCV that is financed by borrowing:
- (a) enables a firm to lock a higher proportion of its long-term capital requirement in at the low cost of debt; but, as a consequence

²⁰³ The relevant proportion is 74% in 2020-21 and falls 1% per annum until it reaches 70% in 2024-25: see Exhibit 058, PR19 final determinations: Aligning risk and return technical appendix, December 2019, page 129.

²⁰⁴ Ibid, page 130.

- (b) increases the riskiness and cost of the remaining equity capital.
252. Since there is no recognition of the second of these factors in Ofwat's outperformance sharing formula, there is a misleading quantification of the impact that changes in gearing have on the overall WACC, and Ofwat ends up concluding erroneously that there is an arbitrage opportunity that does not in reality exist. This is illustrated by a simple worked example provided in Annex 13.
253. A more orthodox position on the link between gearing and the cost of capital is that modest changes in a company's mix of debt and equity do not materially alter a firm's vanilla cost of capital.
254. YWS acknowledges that there are tax advantages associated with higher leverage i.e. because interest is deductible for tax purposes, a company may be able to secure lower overall costs by optimising the amount of debt in its financing structure. Such tax efficiencies were a key driver of step changes in water companies' capital structures that were implemented prior to 2010, however since PR09 Ofwat has had mechanisms in place which pass any tax savings that come from higher leverage through to customers, i.e.:
- (a) Ofwat sets company-specific, modelled tax allowances at each price review based on each individual company's projected gearing (not the notional gearing); and
 - (b) there is a clawback mechanism through which tax savings resulting from any unforeseen step change in gearing that occurs within a five-year regulatory period are logged up and passed through to customers at the next price review.
255. The existing mechanisms mean that YWS's customers are already forecast to save £32m across PR19 by virtue of YWS having a higher debt-to-RCV ratio than a notionally geared company. This is important because it means that the CMA can disregard tax effects and focus its analysis on the relationship between gearing and the vanilla WACC.
256. Table 12 below, reproduced from Ofwat's January 2020 financial resilience report, shows that water companies variously maintain gearing ratios in the range 60% to 80%. The variation in approaches to financing is important because the RPI-X form of regulation provides companies with strong incentives to minimise costs, including financing costs. If there were material differences between vanilla WACCs at different levels of gearing, one would expect to see clustering of water companies around the 'optimal' capital structure. The fact that Table 12 shows no such consensus position should be read as prima facie evidence that the cost of capital is not particularly sensitive to the choice of gearing within a 60% to 80% range.

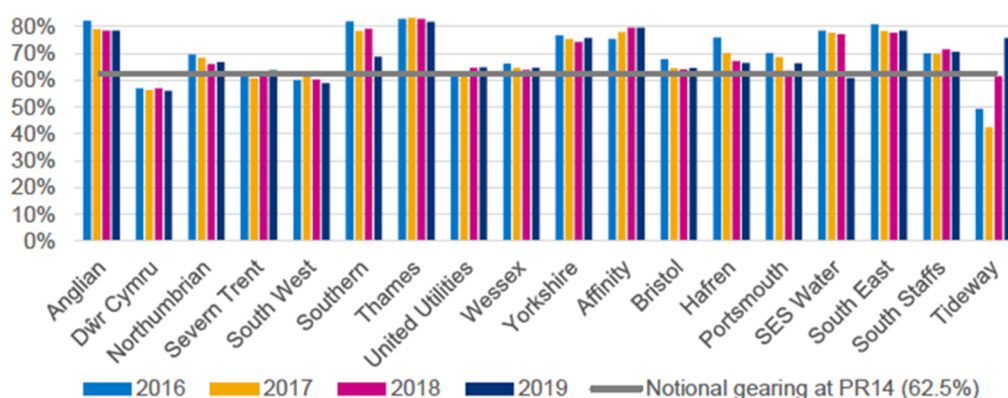


Table 12: water companies’ gearing ratios 2016-2019, reproduced from Ofwat’s January 2020 financial resilience report.

257. This position is consistent with the view that the CMA has expressed in previous inquiries.

“... The UR’s assumption that reducing gearing by ten percentage points does not materially affect WACC is therefore reasonable.”²⁰⁵

“Our analysis suggests that, after taking account of the tax effect, the WACC is not sensitive to the level of gearing ... ”²⁰⁶

“Generally, after taking into account the tax shield from more debt, the WACC is not very sensitive to the level of gearing ... An increase in NIE’s gearing increases the proportion of NIE’s lower cost new debt and tends to reduce its average cost of debt, with the result that its vanilla WACC remains broadly constant.”²⁰⁷

258. Moreover, Ofwat’s PR19 cost of capital consultants made clear statements about the relationship between gearing and the cost of capital in previous reports:

(a) *“We note that the WACC is insensitive to the notional gearing assumption, indeed, our assessment of an alternative notional gearing assumption based upon privately held securitisation structures had limited impact on the WACC”²⁰⁸*

(b) *“... the choice of gearing does not necessarily affect the vanilla WACC since both the cost of equity and the cost of debt change with gearing”²⁰⁹*

259. The above clearly demonstrates there is no rational basis for awarding companies with small differences in gearing different costs of capital. Ofwat’s

²⁰⁵ Exhibit 059, CMA (2017), Firmus Energy (Distribution) Limited vs Northern Ireland Authority for Utility Regulation – final determination.

²⁰⁶ Exhibit 060, CC (2010), Bristol Water plc, appendix N, paras 30 to 35 and annex 2.

²⁰⁷ Exhibit 061, CC (2014), Northern Ireland Electricity Ltd, para 13.36.

²⁰⁸ Exhibit 062, PwC (2017), Estimating the cost of capital for H7.

²⁰⁹ Exhibit 063, Europe Economics (2010), Cost of capital for NATS (En Route) plc for CP3.

mechanism is highly unsatisfactory in view of the harm that could result to YWS (and its customers) as result of the further pressure on YWS's investability.

The right approach to financeability in the water sector

260. As explained at paragraphs 46 to 52 above, when making its PR19 determinations, Ofwat is under a duty to secure that appointed businesses can finance the proper carrying out of their statutory functions.
261. This means that an efficient company should:
- (a) be able to raise finance in the debt capital markets on reasonable terms; and
 - (b) expect to earn a return that is in line with investors' cost of capital (referred to as "investability" or being "investable" within this Statement).
262. The water industry has a long-term investment horizon that requires a sustainable approach to the financing and management of its assets. Therefore, it is critical that its ability to raise finance and the overall returns available to investors also remain relatively stable from one AMP period to another.

An efficient company should be able to raise finance in the debt markets on reasonable terms

263. In previous reviews, Ofwat spelled out explicitly how and why it considers that companies will be able to raise finance in the debt markets, in particular by confirming in quantitative and qualitative terms that projected cashflows permit the notional company to maintain a solid investment-grade credit rating. This has also been the CC/CMA's approach in the inquiries that it has conducted.
264. Therefore, it was a source of genuine concern to YWS that there was no real recognition of the financeability challenges that Ofwat's new price controls present to the sector until the very last stages of the price review.
265. Ofwat's FD did, belatedly, see Ofwat take on some degree of responsibility for the damage that PR19 was causing to sector-wide financial ratios and credit ratings. It identified that 12 out of 17 companies were looking at interest cover ratios that are incompatible with a Baa1/BBB+ rating and so provided for revenues to be accelerated, for all 12 companies, from future control periods to improve cashflows in AMP7. However, Ofwat's response fell far short of providing any increased assurance that YWS will be able to access the long-term debt finance for its requirements in the 2020-25 regulatory period. This is principally because:
- (a) YWS's covenant definitions specifically exclude the benefit of any accelerated revenue when calculating interest cover ratios, which results in a stronger covenant that is consistent across AMPs;
 - (b) two rating agencies have determined that they will disregard Ofwat's PR19 revenue acceleration in their rating assessments; and hence

- (c) interest cover, as calculated for rating purposes, for most companies in the sector remains well below the threshold values for a Baa1/BBB+ rating.

266. Ofwat's modelling of key financial ratios under YWS's FD is given in the table below.

	2020/21	2021/22	2022/23	2023/24	2024/25	5-year average
Gearing	60.23%	60.80%	61.05%	60.76%	59.86%	60.54%
AICR (Moody's)	1.36	1.35	1.34	1.35	1.37	1.35
FFO/net debt	10.25%	9.00%	8.68%	8.77%	8.94%	9.13%

Table 13: Ofwat's modelling of key financial ratios. *Note:* AICR and FFO/net debt represent Ofwat's alternative calculations which have been calculated in a manner that is consistent with the calculations made by Moody's and Fitch. This differs from the calculation presented by Ofwat in its FD because Moody's and Fitch do not take advancement of revenues into account when computing the numerator in the AICR calculation and because S&P include accretion of index linked debt when calculating FFO.

267. The main point to note about this table is that AICR is well below the minimum 1.5x threshold that Moody's²¹⁰ has indicated a company will need to achieve in order to obtain a Baa1 rating. YWS's understanding is that most companies in the sector are looking at broadly similar ratios. This has triggered an ongoing negative view of credit quality across the sector, as evidenced by recent downgrades, which has been discussed above in paragraphs 236 to 240.
268. YWS has three main concerns with the situation, as follows:
- (a) firstly, lower sector-wide credit ratings needlessly restrict the appetite of debt investors that are available to fund new investments;
 - (b) secondly, sector-wide downgrades will increase the sector-wide cost of debt, which will be ultimately paid by consumers in the long-term; and
 - (c) thirdly, lower ratings adversely affect the sector's financial resilience, in particular by eliminating much of the buffer that companies have to the lowest rung of the rating agencies' investment-grade credit ratings.
269. These are serious matters that should have been identified and remedied by Ofwat as part of its determinations. It now falls to the CMA to ensure in its determination that YWS's appointed business has sufficient cashflows to obtain and maintain investment-grade credit ratings, pursuant to Ofwat's duty to secure that companies are able to finance their activities.

²¹⁰ Moody's May 2018 'Regulator's proposals undermine the stability and predictability of the regime', see https://www.moody.com/research/Moodys-changes-outlook-to-negative-on-ratings-of-4-UK--PR_383966.

270. The most direct remedy for the weakness shown in Table 13 above will be for the CMA to provide in price controls for a rate of return that is commensurate with the cost of capital. As explained in paragraphs 218-227 above, Ofwat has under-estimated several of the inputs to its cost of capital calculation, including the risk-free rate, the expected market return, beta, and the cost of new debt. If the CMA corrects the errors that have been identified, Ofwat's alternative calculation of AICR should naturally increase to sit above the 1.5x thresholds indicated by Moody's for a Baa1 rating.
271. For completeness, YWS notes that the acceleration of revenue from future control periods – whether in the form proposed by Ofwat or using some other lever – to boost short-term interest cover is not a sustainable long-term fix for financeability.
- (a) Moody's has been very clear that: *"We will continue to remove the regulatory depreciation as well as excess PAYG to calculate company-specific AICR ratios"*.²¹¹
 - (b) Fitch has the same policy, stating that it will: *"...adjust PMICRs to align accounting treatment of opex with the regulatory treatment if companies use the PAYG rate above the accounting level."*²¹²
272. Ofwat's representation to the CMA that its *"financial model contains a suite of financial ratios that are commonly used by credit rating agencies"* is therefore incorrect.²¹³ The only implication this has is that the response to the weak interest cover shown in Table 13 has to fundamentally impact value and not just be a timing solution.
273. Nor is it correct to say, as Ofwat does in its Cross-Cutting Issues Paper and its YWS-Specific Paper, that the financeability issues that it has created for the industry are as a result of some companies' failure to follow its resilience planning principles. Ofwat suggests that some companies with high levels of gearing and/or a high cost of debt need to take steps to maintain their financial resilience.²¹⁴ In fact, as explained in the following paragraphs, YWS's regulated debt platform provides additional protections in the long-term interests of customers, allowing it to carry debt at levels above the assumed 60% notional level of gearing.

YWS's Capital Structure

274. Contrary to the position advanced in Ofwat's YWS-Specific Paper, YWS's regulated debt platform operates in the long-term interests of its customers. Particular beneficial features include:

²¹¹ Ibid.

²¹² Exhibit 064, Fitch Ratings (2018), Fitch revises outlook on 3 UK water holding companies to negative.

²¹³ Exhibit 013, Transcript of the 4 February 2020 Ofwat Teach-in, page 52, lines 16-17.

²¹⁴ Exhibit 003, Ofwat's Cross-Cutting Issues Paper, paragraph 7.11.

- (a) the provision of a common covenants and security package for all secured creditors that includes restrictions on activities other than those necessary for YWS's licence undertakings/obligations;
 - (b) the flexibility to raise debt in various forms from investors internationally and structural enhancements that allow beneficial treatment from ratings agencies in comparison to unsecured financing arrangements;
 - (c) reporting and ratings undertakings that ensure secured creditors are updated regularly on YWS's financial health; and
 - (d) enhanced rights for secured creditors when there are early signs of stress and an automatic standstill period of 18 months in the event of default to facilitate resolution of a default and to incentivise secured creditors to maintain the business a standstill.
275. The structure of a regulated debt platform enables companies to carry debt at levels above the assumed 60% notional level of gearing and to raise new debt at an equivalent price to a company without a similar debt platform at a lower level of gearing.
276. This ability to raise increased levels of debt at an equivalent cost puts YWS in a stronger position to be able to quickly adjust to unexpected risks, as the debt market is much more liquid than the equity market. YWS therefore takes exception to the characterisation of its capital structure in Ofwat's YWS-Specific Paper, which is unwarranted and misconceived. Moreover, the matters alluded to in that paper were not at issue in the PR19 process and are wholly irrelevant to this redetermination. YWS reserves the right to return to this topic in due course.

The notionally efficient firm is not investable

277. The evidence set out in paragraphs 130 to 134 of this Statement demonstrates that Ofwat has:
- (a) under-estimated the expenditure that an efficient company will incur when providing services to customers between 2020/21 and 2024/25;
 - (b) overstated the performance levels that an efficient company can reasonably expect to achieve in this period;
 - (c) set up a financial incentive regime that is skewed towards penalty payments;
 - (d) provided a rate of return on the RCV that falls short of the weighted average of the cost of debt and the cost of equity; and
 - (e) left shareholders having to deal with inadequate interest cover and an ensuing financeability problem.
278. The bottom line at the end of this analysis is that an investor looking at Ofwat's PR19 FD as a package could not reasonably conclude that YWS is a viable investment opportunity. To the contrary, investors would expect to

incur a financial loss as a result of likely over-spending, penalties for shortfalls in performance, the inadequate return on the RCV and/or the costs of reinstating an acceptable credit rating.

279. In Annex 1, Economic Insight quantifies the expected loss as the equivalent of a shortfall of approximately 100 basis points against Ofwat's allowed base equity return for YWS. No rational, long-term investor would be willing to take on this loss (notwithstanding said investors would also regard the allowed return itself as being insufficient).
280. It now falls to the CMA to construct a set of price controls which properly discharges Ofwat's duty to secure that the licensed business is able to finance its activities. This entails constructing a 'fair bet' such that an investor looking at likely efficient cashflows over a five-year period sees as much upside potential as downside risk around a central case in which the investor makes a return that is in line with his/her opportunity cost of capital.
281. YWS accepts this will require the CMA to ensure that YWS's expenditure and performance plans are sufficiently challenging as regards costs, performance and returns. Equally, the CMA must avoid falling into the trap that Ofwat fell into of setting targets and allowances that repeatedly ask more than can be expected of an efficient company. A truly 'investable' proposition will require that the CMA:
 - (a) looks at costs, performance and return together as a package rather than in separate silos;
 - (b) is guided by evidence; and
 - (c) sense checks that the individual building blocks in price control calculations combine coherently together to present investors with a fair likelihood of earning a rate of return that is commensurate with returns that are on offer elsewhere (i.e. the opportunity cost of capital).

Disconnect between risk and return

282. Standing back from all the methodological issues with the FD described above, it is evident that overall the FD fails to strike the right balance between risk and return. This lack of balance arises from numerous and manifest errors of fact, analysis and assessment by Ofwat, the absence of adequate risk mitigants in its approach, and the failure adequately to consider YWS's individual circumstances and its starting point as an efficient, well-performing company. When combined with the issues arising from the misidentification of the notionally efficient firm, this creates a substantial increase in risk while at the same time Ofwat has determined a WACC that falls below an adequate return. As a consequence, YWS's Board considered that the balance of risk and return in the FD was not one that it could accept. In reaching this view, the Board also had regard to the material consequences of the FD on its customers, present and future, on Yorkshire and on the company, as set out below.

H. The material consequences of the FD

283. As set out in Section G above, the various flaws in the FD combine to create an efficiency challenge that an efficient firm would not be expected to meet. In practical terms this means that YWS has not been allowed the efficient costs necessary to deliver its Business Plan and faces a downside skew in its expected risk position. Modelling by Economic Insight indicates that the downside skew of its penalty position will be in excess of £150m during AMP7 in the absence of management mitigating actions,²¹⁵ although it also needs to be born in mind that not all of these risks (e.g. flooding) are susceptible to management remediation.
284. The unavoidable consequence of this is that YWS would have to step away from its Business Plan which, as explained in Section E above, was firmly set in the context of YWS's long-term strategy, was supported by its customers and stakeholders, and already contained a significant degree of stretch in terms of costs and outcomes. The gap created by Ofwat's interventions is simply too wide to bridge.
285. This would cause material harm to YWS and both its current and future customers in the following areas, all of which are contrary to Ofwat's stated objectives for PR19:
- (a) First, it would **put YWS's long-term resilience at risk**, by undermining YWS's plans to meet the mounting challenges it faces in this area and forcing it to adopt an increasingly short-term focus.
 - (b) Secondly, it would **impact on YWS's sustainability**, and potentially force YWS to adopt less environmentally sound solutions to those proposed in its Business Plan.
 - (c) Thirdly, it would **stifle innovation**, including in areas of cooperation with others (in particular those focussed on responding to the effects of climate change), which are of benefit not only to Yorkshire, but more widely too.

Undermining Resilience

286. Resilience in the water industry concerns the ability to cope with, and recover from disruption, and anticipate trends and variability, for example in weather conditions, in order to maintain services for people and protect the natural environment, now and in the future.
287. The resilience challenge faced by YWS is the combined effect of: (i) 'chronic factors' such as population growth, changing demographics and customer behaviours, asset deterioration, and changing weather patterns; and (ii) 'acute

²¹⁵ Annex 5, Economic Insight report, Ofwat's approach to ODI interventions in the final determinations, pages 5, 44.

factors’ such as extreme weather events.²¹⁶ The growing scale of these pressures mean that their impact on YWS’s resilience is forecast to be much greater in the future than they have been in the past. Meeting this challenge will require targeted interventions and increased investment. Contrary to Ofwat’s statements to the CMA, expenditure on resilience is not “discretionary”²¹⁷ but essential.

288. YWS’s resilience framework sets out five qualities of resilience: Resistance, Reliability, Redundancy, Response & Recovery, and Reflection, the first four of which are aligned to Ofwat and the Cabinet Office’s four categories of effective infrastructure resilience. YWS added a fifth element to ensure attention on the value from learning from events and latest developments in global resilience best practice. It is recognised that in order to maximise resilience, interventions in all categories should be deployed.
289. In response to the clear direction from Ofwat that ‘significant’ bill reductions were expected in AMP7, the resilience interventions that YWS planned to make in its Business Plan were focused on response and recovery and short-term reliability, instead of being better balanced across the five qualities. In practical terms this means that YWS’s Business Plan leant more towards repair rather than replacement of ageing infrastructure. The reason for this is that repairing assets is often cheaper in the short term, which helps to keep customer bills low today (which accords with the current regulatory regime).
290. However, while replacement of assets often requires relatively more expensive up-front capital investment, the whole life costs are often cheaper. In other words, from a long-term perspective replacement is often the better option.
291. The current regulatory focus on reducing costs cannot be sustained indefinitely. There will come a point at which future customers will be required to bear the cost of building in resistance, redundancy and long-term reliability at the point where the other approaches are no longer viable.
292. One of the key effects of the FD is that it would force YWS to increase the focus on response and recovery and short-term reliability to the point where YWS’s long-term resilience would be materially impacted. This is the combined effect of: (i) the fact that YWS has not been allowed the efficient costs necessary to deliver its Business Plan, so must look for cheaper alternative solutions to the issue it faces; and (ii) the penalty exposure that YWS faces as a result of the downside skew in its risk profile. The potential pressure on YWS’s financial headroom that the FD entails would leave YWS with no option other than to depart even further from the Business Plan developed with its customers, focusing on short-term mitigating actions designed to reduce the penalties from the materially flawed ODI package.

²¹⁶ As regards the latter, by way of example Storm Ciara in February 2020 caused 56 internal sewer flooding incidents in a single day. The recent flood losses in November 2019 (c. £17m) and February 2020 (c.£15m) have materially increased the insurance costs faced by YWS.

²¹⁷ Exhibit 011, Transcript of the 25 February 2020 Ofwat Teach-in, page 25, lines 8-9; page 26, line 14.

293. For example, as a result of Ofwat’s decision not to fund UQ performance in the comparable Performance Commitments, which only became apparent at the IAP stage, YWS was forced to reallocate around £178m of its budgeted costs from Capex to Opex in order to manage its expected penalty position.
294. In short, delivering the FD would force YWS to move further away from long-term capital investment towards reactive operational expenditure, which has material ramifications for YWS’s resilience. This concern is underscored by a preliminary analysis being undertaken for YWS by Arup to quantify the difference in the maturity of YWS’s resilience between its Business Plan and the FD. Arup’s emerging conclusion reveals that the FD would reduce resilience across two thirds of the 16 systems (or functions) comprising YWS’s internal Resilience Framework in AMP7, and more substantially in its long-term financial planning. Arup states in its preliminary conclusions “*As expected, the maturity score changes are generally subtle but show that the Final Determination is likely to have an adverse impact in the 2025 resilience position. The impact is greater for the ‘Long term viability planning’ system due to the relatively small number of applicable shocks and stresses (i.e. there is no smoothing effect).*” Any degradation in resilience over five years is a significant concern to YWS and is inconsistent with Ofwat’s resilience duty; YWS will revert to this issue in due course.
295. Some examples of the kinds of issues that will arise in practice in relation to YWS’s resilience include:
- (a) To maintain service levels to customers in relation to internal sewer flooding, YWS would need to employ short-term sewer ‘jetting’ solutions to unblock sewers rather than investing in the underlying asset by installing no-return valves or investing in ‘blue-green solutions’²¹⁸, which reduce flooding risks at root cause but involve higher upfront cost.²¹⁹
 - (b) YWS would have to reduce investment in increasing hydraulic capacity (volume of sewers) to focus on ‘other causes’ of flooding, in order to achieve the speed of service improvement required by the internal sewer flooding Performance Commitment. This could result in insufficient hydraulic capacity to deal with population growth and climate change.
 - (c) YWS would not be able to deliver a number of intended base maintenance schemes, which is anticipated to lead to reduced resilience and a higher probability of asset failure. For example, in its Business Plan, YWS intended to invest in several water recycling schemes that it would not be able to deliver as a result of the FD. The

²¹⁸ These involve, for example, urban retention ponds, natural green walls, multifunctional roof gardens, storm water harvesting and recycling systems which provide a systematic and sustainable flood reduction solution.

²¹⁹ Though it should be noted that even if this approach were adopted, YWS would still expect to incur around £36m in penalties in relation to this Performance Commitment during AMP7.

impact of this is that YWS would no longer be minimising the water abstracted from the environment and would, therefore, leave water stocks in a less resilient position than YWS had planned.

- (d) YWS has historically replaced customers' water meters when they become asset life expired. As a result of the FD, meters would have to be fixed on failure only. This carries the risks of meter under-registration, impacts on customer perceptions, and pushes asset replacement into the future, resulting in a greater burden on YWS and its customers in future periods.
- (e) In order to meet the stretching UQ Performance Commitment for leakage, YWS would have to pursue a larger percentage of patch repairs and structural lining of pipes as the preferred approach to water pipe rehabilitation, rather than replacement. The former two are cheaper solutions in the short term and maintain operability but will likely require further investment in the future and therefore have poorer whole life cost than replacement.²²⁰ Moreover, overreliance on structural lining of pipes presents risks to YWS's deliverability in that (i) the necessary regulatory approvals have yet to be attained from the Drinking Water Inspectorate (**DWI**) and (ii) although the technology is well-recognised to be viable, whether it would provide the necessary longevity is still to be proven.
- (f) YWS would be forced to decrease investment in drainage area studies. The models informed by these studies are a key tool in understanding and managing the performance and capacity of the wastewater network and predicting the risk of sewer flooding. Well-informed models are critical to meeting the future challenges of population growth and climate change. The reduction in investment would pose a risk to YWS's service delivery and asset planning. It would also hinder the assistance that YWS can give to the Environment Agency and local authorities, with whom YWS shares its drainage models.
- (g) YWS would be forced to reuse existing concrete tanks to fulfil obligations under WINEP. The tanks would be refurbished rather than replaced, meaning that they are likely to require further interventions in the future to maintain performance (i.e. a reduced residual asset life when compared to a new asset).

²²⁰ Sprayed structural lining is a new technology for water mains. Previously, linings were non-structural for quality purposes. This means that they protected water quality but did not extend the overall life of the asset. Structural linings are currently being promoted in the industry as cheaper and better for the environment. YWS is one of the leading companies supporting the introduction of this specific technology as a key innovation to extend the life of water mains. However, as this technique is unproven it is inherently riskier. YWS will not know for, say, 20 years whether this technology has worked and is resilient when compared to mains replacement. As with all such new technologies, the less risky option would be for YWS to introduce the technology more gradually, rather than being forced into a solution that could later result in widespread failures across the network.

296. YWS acknowledges that optimal solutions from a whole-life cost perspective are not achievable in all cases, but a balance must be struck. The problem with the FD is that it pushes this balance too far towards short-termism, which in turn means that YWS may not be able to meet the resilience challenge that it faces.
297. In its October 2019 strategy paper, ‘Time to act, together’, Ofwat emphasised the importance of its price review determinations in driving investment and sustainable change that benefits customers, the environment and wider society over the long term. As part of this, Ofwat expressed particular concern that *“company focus may still be principally on meeting five-year targets at the expense of longer-term thinking.”*²²¹ The considerations outlined above show that the FD will force YWS to adopt precisely the short-term, AMP7-target focussed approach that Ofwat wanted to avoid.
298. The inevitable consequence of these unavoidable actions is harm both to YWS’s customers today (in the sense that they fail to get the most cost-effective solution) and to those tomorrow (who will face the mounting costs of replacing more and more ageing infrastructure).
299. These challenges have been further heightened during PR19, because of the changes made to the Totex sharing mechanism. Sharing rates have been substantially reduced as a result of Ofwat having decided (in YWS’s view, erroneously) that YWS has departed from its long track record of cost efficiency. The change implemented to the timing of the Totex sharing mechanism at the DD stage is also deeply unhelpful in this regard, with any additional revenues only crystallising at the start of the next AMP. In addition to creating an unnecessary extra dimension of regulatory risk, this impacts adversely on cash-flow timing and creates further financeability challenges.

Environmental Impacts

300. The FD’s allowed costs in relation to YWS’s WINEP obligations has potentially damaging environmental effects relative to those in YWS’s Business Plan.
301. A central feature of the WINEP programme (whose scale is significantly larger than those in previous AMPs) is the requirement to remove phosphorous from wastewater prior to the water re-entering the rivers at sewerage treatment works. In its Business Plan, YWS identified 80 sewage treatment works as requiring phosphorous removal pursuant to its WINEP obligations. Of these 80 treatment works, three were to be addressed by transferring the sewage to larger treatment facilities and 77 were to be addressed using on-site treatment of wastewater.²²²
302. There are different approaches available for on-site phosphorous removal at these 77 locations that would meet YWS’s obligations under the UWWTD. One of these approaches involves chemical dosing (i.e. the introduction of

²²¹ Exhibit 065, , page 35.

²²² Exhibit 001, YWS, PR19 Business Plan, page 80.

ferric sulphate into the wastewater). However, YWS has serious environmental-related reservations about proceeding in this way given: (i) the impact of discharging ferric sulphate into rivers; (ii) the extensive use of noise- and emission-polluting tankers to deliver ferric sulphate to the sewerage works; and (iii) the storage of the chemical at the relevant sites. Furthermore, ferric sulphate is becoming increasingly difficult to source and is likely to increase in cost as a result, leading to higher costs for future customers.

303. An alternative to chemical dosing is the BNR²²³ process, which reduces the above-mentioned environmental concerns and is the more sustainable approach.
304. When developing its Business Plan, YWS established that sewerage treatment works servicing 88% of YWS's customers were capable of using BNR. The initial capital outlay on construction costs for the use of BNR at these 18 sites was estimated to be £636m, as compared with £447m for chemical dosing. However, the operational expenditure for BNR was estimated to be only £29m per annum, as compared with £40m per annum for chemical dosing. The use of BNR at all 18 sites therefore has the more favourable whole-life costs over a 40-year period and would have been the most efficient solution for YWS's customers in the long term.
305. However, YWS was mindful of Ofwat's regulatory objectives in terms of affordability of water bills and its desire to introduce a stretching efficiency challenge in PR19. In order to meet these requirements, YWS proposed an environmentally sub-optimal solution in its Business Plan. In particular, rather than selecting treatment types on the basis of whole life costs alone, YWS applied a hybrid methodology that selected treatments on the basis of what would produce both the lowest whole-life cost and the lowest capital expenditure overall. This approach resulted in only seven of the 18 treatment works being selected for BNR in YWS's Business Plan.
306. Despite YWS's considered plan, Ofwat's FD allowed £113m less than YWS required to allow YWS to implement its plans, even on its more modest scale.²²⁴ YWS categorically refutes Ofwat's unfounded and unjustified suggestion that YWS's costs were not efficient, which is inconsistent with YWS's undisputed track record of being an efficient firm and overwhelming customer support for its Business Plan.²²⁵ The true cause of underfunding is the deficiency in Ofwat's modelling addressed at paragraph 197(c) above. The FD thus forces YWS to select solutions that are cheaper again still, but have a worse environmental impact, directly contradicting YWS's customers' support for a greater focus on environmental solutions (in addition to costing its customers more in the long term and thereby contributing to intergenerational unfairness).

²²³ Biological Nutrient Removal.

²²⁴ Ofwat reduced YWS's WINEP costs by £168.9m overall, £113m of which relates to phosphorous removal.

²²⁵ See Section B.

Stifling innovation

307. Innovation, and its deployment to enhance resilience, was a key theme of Ofwat's approach to PR19.²²⁶
308. Despite this, YWS's innovative programme to strengthen the resilience of Hull and Haltemprice against extreme flooding events will be heavily scaled back for a further five years as a result of Ofwat's material underfunding.
309. Hull is the most vulnerable city in the UK to flooding after London. The city is liable to flooding from many different sources²²⁷ and is unique because the sewer tunnel system is used to drain the city using two large YWS pumping stations.
310. Modelling was undertaken to predict the number of properties in Hull which would suffer external and internal flooding in the event of various levels of storm and/or extreme weather predicted that:
 - (a) For a one-in-five year storm, 13.7% would flood externally and 3.2% would flood internally;
 - (b) For a one-in-thirty-five year storm, 25.5% would flood externally and 10.8% would flood internally; and
 - (c) For a one-in-seventy-five year storm, 30.3% would flood externally and 18.5% would flood internally.
311. These are high proportions and show that internal and external sewer flooding are connected, particularly as both rely on the YWS sewer system to mitigate the risk where possible.
312. Partnership is required to understand how the risk of flooding from surface water interacts with other flood sources, and YWS's sewer system, to allow integrated solutions to be developed.
313. YWS has been working in collaboration with the Environment Agency, Hull City Council and East Riding of Yorkshire Council since 2007, following the worst surface water flooding event ever in the UK, where 9,000 homes in Hull were flooded. A number of significant schemes have been developed individually by the partners since that time to reduce flood impact, however the risk to people, businesses and property remains high. In 2016 YWS sought a fresh approach to resolve the devastating impact resulting from surface water flooding and insufficient sewer capacity to deal with the huge volumes of water entering it during large rainfall events.
314. YWS commissioned Arup to conduct a study to explore potential solutions. Due to the specific characteristics and topography of the Hull area it was assessed that one available method of releasing flood water was to attenuate the water before slow release back into the sewers. This led to a wide range of

²²⁶ Exhibit 013, Transcript of the 4 February 2020 Ofwat Teach-in, page 18, lines 6-10.

²²⁷ Pluvial / surface water, fluvial and tidal inundation.

potential innovative solutions being identified to serve this purpose, including the use of detention basins, swales, permeable paving, verge planters and street planters. When modelled, these solutions gave a substantial overall reduction of sewer flooding of 9.2% and the cost of implementing these solutions was calculated to be 30% cheaper than traditional solutions involving concrete storage tanks (which hold excess water until the flooding subsides after which the excess water is pumped back into the sewers).

315. The surface water flood risk in Hull and Haltemprice is complex and integrated, and the modelling work to date has helped the local Risk Management Authorities to better understand how that risk is shared.
316. YWS established a more formal partnership in 2017, the Living with Water Partnership (**LWWP**), to work on an integrated catchment basis, developing innovative solutions to combat these significant flooding events faster. The LWWP is now central to the city's regeneration plans, attempting to build a long-term strategy to improve the city's resilience against flooding. The partnership has gained international recognition for its innovative and collaborative approach. Funding was also awarded to establish a City Water Resilience Index that is being trialled in Hull alongside major cities across the world.
317. The investment required to address the issues in Hull and included in YWS's PR19 Business Plan anticipated £50m in investment required to deliver the benefits associated with certain of these solutions. Of this, YWS sought £28.7m in its Business Plan in allowed costs, with the balance of £21.3m still to be achieved through partnership funding. In its FD, however, Ofwat allowed YWS only £16.4m for projects in Hull – a shortfall of £12.3m.
318. The method by which Ofwat reached this allowance is opaque and involves a calculation using Ofwat's implicit allowance of £3.97m to YWS to reduce internal sewer flooding.²²⁸ There is a disconnect between this seemingly ad-hoc methodology and the outcomes being sought for YWS customers to significantly reduce holistic flood risk in Hull. The allowance is significantly below YWS's modelled costs, which also allowed for a wider range of local flood related risks given Hull's propensity to retain surface water, which YWS's proposed solution is intended to meet.
319. As a result of the FD, a significant amount of this innovative project will not be able to proceed, and this will be a major loss both to the residents of Hull, but also to others outside Hull who will be deprived of the opportunity to learn from this innovative approach and so of the opportunity to deploy it elsewhere.

²²⁸ Ofwat has stated that “*We use the company's implicit allowance for reducing sewer flooding risk to properties to determine an allowance per km of sewer within Yorkshire Water's operating region. Using information in the company's business case we consider this to be equivalent to an allowance of £3.968m for the length of sewer in Hull and Haltemprice. We uplift the base allowance for Hull and Haltemprice to account for the increased risk of sewer flooding in the drainage area, which results in a £16.4m adjustment to the company's base cost allowance.*”

I. Conclusion

320. As noted in the *Introduction* to this Statement, YWS agrees with the general thrust of Ofwat's policy direction at PR19. YWS recognises and is already acting on the need for continuing change. Climate change, housing growth and rising expectations of utilities all mean that water companies need to continue to improve, both on what they deliver and how they do it. However, YWS has been historically efficient and Ofwat has not properly considered the impact of its approach on efficient firms such as YWS.
321. The YWS Board showed itself willing through the PR19 process to identify a compromise position which entailed removing £350 million from its Business Plan and introducing substantially higher risks into the business. This substantial concession was predicated on Ofwat closing the costs gap and adjusting the Performance Commitments package to create a more balanced set of service improvements and incentives. While Ofwat made some adjustments in the FD, these were not sufficient to address the Board's concerns.
322. Moreover, YWS wishes to ensure the methodology for the next price review, and all future price reviews, correctly addresses the various matters identified in this Statement such that future price reviews strike an appropriate balance between near-term need for improved performance at an efficient cost with the longer-term needs of ensuring a safe, secure and resilient service to customers. The work undertaken by Arup (detailed in paragraph 286 et seq.) clearly indicates that the FD sets YWS on a path which will lead to a gradual deterioration of its resilience. This decline must be checked now to avoid future generations having to pay for the short-term gains of current customers.
323. YWS understands that the price control determination is a package assessed "in the round" but it is the accumulation of factors, all of which point in the same direction – i.e. increased risk for YWS – that creates the overall harm in this determination. The combination of the issues arising from the misidentification of the notionally efficient firm, the cost-outcomes disconnect, cost modelling flaws, interventions in the PC/ODI package, and an unwarranted reduction in the WACC, result in a balance of risk and return that is unacceptable. The Board of YWS therefore unanimously concluded that the company had no option but to seek this redetermination.
324. YWS recognises however the very serious consequences for its customers, its operations and the wider economy and society arising from the Covid-19 pandemic. YWS is therefore prepared to make some suggestions at an early stage of the redetermination process as to steps that the CMA could take to adjust Ofwat's FD with a view to bringing this redetermination to a timely conclusion in the national interest.

YORKSHIRE WATER STATEMENT OF CASE – APPENDICES

Annex	Document
01.	Economic Insight, Financeability of the notionally efficient firm: a bottom-up analysis
02.	Economic Insight, Ofwat’s approach to risk analysis in the final determinations
03.	Not used
04.	Economic Insight, Ofwat’s approach to funding upper quartile performance
05.	Economic Insight, Ofwat’s approach to ODI interventions in the final determinations
06.	Economic Insight, Top-down analysis of the financeability of the notionally efficient firm
07.	Not used
08.	Oxera, Integrating cost and outcomes
09.	Oxera, Issues with Ofwat’s frontier shift assessment in PR19
10.	Oxera, Issues with Ofwat’s approach to determining the cost benchmark
11.	Mark Ballamy, expert opinion on YWS’s WRFIM adjustment claim
12.	Paper on Retail Market Deduction
13.	Gearing Outperformance Sharing Mechanism worked example